

=> FILE HCAPLUS

FILE 'HCAPLUS' ENTERED AT 13:05:30 ON 16 APR 2004

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FILE COVERS 1907 - 16 Apr 2004 VOL 140 ISS 17

FILE LAST UPDATED: 15 Apr 2004 (20040415/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> D QUE L30

L1	184	SEA FILE=HCAPLUS ABB=ON	COMPOSITE?(L)METAL?(L) IONIC?(L) POLYMER ?
L2	49	SEA FILE=HCAPLUS ABB=ON	L1 AND (NOBLE OR PT OR AU OR AG OR GOLD OR SILVER OR PLATINUM)
L3	1	SEA FILE=HCAPLUS ABB=ON	L2 AND (NONNOBLE OR (NON OR NONE) (1A)NOBLE)
L4	11	SEA FILE=HCAPLUS ABB=ON	L2 AND (COPPER OR CU OR AL OR ALUMINUM OR ALUMINIUM)
L5	14	SEA FILE=HCAPLUS ABB=ON	L2 AND CATION?
L6	2	SEA FILE=HCAPLUS ABB=ON	L2 AND (FE OR IRON OR FERR? OR NI OR NICKEL OR HG OR MERCUR?)
L7	812	SEA FILE=HCAPLUS ABB=ON	NONNOBLE OR (NON OR NONE) (W)NOBLE
L8	1	SEA FILE=HCAPLUS ABB=ON	L1 AND L7
L9	115107	SEA FILE=HCAPLUS ABB=ON	COMPOSITES/IT
L10	965	SEA FILE=HCAPLUS ABB=ON	L9(L) POLYMER?(L)METAL?
L11	2	SEA FILE=HCAPLUS ABB=ON	L7 AND L10
L12	5	SEA FILE=HCAPLUS ABB=ON	L10 AND PRECIOUS(3A)METAL?
L13	57	SEA FILE=HCAPLUS ABB=ON	(L1 OR L10) AND (PD OR PALLADIUM)
L14	28	SEA FILE=HCAPLUS ABB=ON	L3 OR L4 OR L5 OR L6 OR L8 OR L11 OR L12
L15	31	SEA FILE=HCAPLUS ABB=ON	L13 AND (FE OR IRON OR FERRIC OR FERROUS OR NI OR NICLE OR CARBON OR C OR HG OR MERCURY)
L16	9	SEA FILE=HCAPLUS ABB=ON	L15 AND CONDUCT?
L17	0	SEA FILE=HCAPLUS ABB=ON	L15 AND IONIC
L18	36	SEA FILE=HCAPLUS ABB=ON	L14 OR L16 OR L17
L21	22399	SEA FILE=HCAPLUS ABB=ON	(GOLD OR AU OR PD OR PALLADIUM OR PT OR PLATINUM OR NOBLE) (3A) (CLAD OR COAT?)
L22	42	SEA FILE=HCAPLUS ABB=ON	L7 AND L21
L23	1	SEA FILE=HCAPLUS ABB=ON	L22 AND POLYMER?(4A)COMPOSITE?
L24	3	SEA FILE=HCAPLUS ABB=ON	L22 AND ?POLYMER?
L25	424	SEA FILE=HCAPLUS ABB=ON	PRECIOUS(2A)METAL?(5A)COAT?
L26	4	SEA FILE=HCAPLUS ABB=ON	L25 AND L7
L27	0	SEA FILE=HCAPLUS ABB=ON	L26 AND ?POLYMER?
L28	3	SEA FILE=HCAPLUS ABB=ON	L25 AND (CONDUCT?(3A)?POLYMER?)

L29 5 SEA FILE=HCAPLUS ABB=ON L18 AND COATING?/SC,SX
L30 45 SEA FILE=HCAPLUS ABB=ON L18 OR L23 OR L24 OR (L26 OR L27 OR
L28 OR L29)

=> FILE WPIX

FILE 'WPIX' ENTERED AT 13:05:43 ON 16 APR 2004

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FILE LAST UPDATED: 8 APR 2004 <20040408/UP>
MOST RECENT DERWENT UPDATE: 200424 <200424/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

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=> D QUE L41

L32 553 SEA FILE=WPIX ABB=ON COMPOSITE?(3A)POLYMER?(3A)METAL?
L33 71 SEA FILE=WPIX ABB=ON L32 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER)
L34 2 SEA FILE=WPIX ABB=ON L33 AND (NONNOBLE OR (NON OR NONE) (1A)NOB
LE)
L39 58 SEA FILE=WPIX ABB=ON L33 AND (FE OR IRON OR FERRIC OR FERROUS
OR NI OR NICKEL OR CARBON OR C OR HG OR MERCURY OR AL OR CU OR
COPPER OR ALUMINUM OR ALUMINIUM)
L40 4 SEA FILE=WPIX ABB=ON L39 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER) (2A) (COAT?
OR CLAD?)
L41 6 SEA FILE=WPIX ABB=ON L34 OR L40

=> FILE INSPEC

FILE 'INSPEC' ENTERED AT 13:06:25 ON 16 APR 2004

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FILE LAST UPDATED: 13 APR 2004 <20040413/UP>
FILE COVERS 1969 TO DATE.

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THE BASIC INDEX >>>

=> D QUE L42

L32 553 SEA FILE=WPIX ABB=ON COMPOSITE?(3A)POLYMER?(3A)METAL?
L33 71 SEA FILE=WPIX ABB=ON L32 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER)
L34 2 SEA FILE=WPIX ABB=ON L33 AND (NONNOBLE OR (NON OR NONE) (1A)NOB
LE)
L39 58 SEA FILE=WPIX ABB=ON L33 AND (FE OR IRON OR FERRIC OR FERROUS
OR NI OR NICKEL OR CARBON OR C OR HG OR MERCURY OR AL OR CU OR
COPPER OR ALUMINUM OR ALUMINIUM)
L40 4 SEA FILE=WPIX ABB=ON L39 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER) (2A) (COAT?
OR CLAD?)
L42 0 SEA FILE=INSPEC ABB=ON L34 OR L40

=> FILE COMPENDEX

FILE 'COMPENDEX' ENTERED AT 13:06:37 ON 16 APR 2004

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=> D QUE L48

L32 553 SEA FILE=WPIX ABB=ON COMPOSITE?(3A)POLYMER?(3A)METAL?
L33 71 SEA FILE=WPIX ABB=ON L32 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER)
L34 2 SEA FILE=WPIX ABB=ON L33 AND (NONNOBLE OR (NON OR NONE) (1A)NOB
LE)
L39 58 SEA FILE=WPIX ABB=ON L33 AND (FE OR IRON OR FERRIC OR FERROUS
OR NI OR NICKEL OR CARBON OR C OR HG OR MERCURY OR AL OR CU OR
COPPER OR ALUMINUM OR ALUMINIUM)
L40 4 SEA FILE=WPIX ABB=ON L39 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER) (2A) (COAT?
OR CLAD?)
L41 6 SEA FILE=WPIX ABB=ON L34 OR L40
L45 66 SEA FILE=COMPENDEX ABB=ON L32 AND (NOBLE OR PRECIOUS OR AU OR
GOLD OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER)
L47 0 SEA FILE=COMPENDEX ABB=ON L45 AND (NOBLE OR PRECIOUS OR AU OR
GOLD OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER) (2A) (COAT?
OR CLAD?)
L48 0 SEA FILE=COMPENDEX ABB=ON L41 OR L47

=> FILE JICST

FILE 'JICST-EPLUS' ENTERED AT 13:06:49 ON 16 APR 2004

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FILE COVERS 1985 TO 12 APR 2004 (20040412/ED)

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TERM (/CT) THESAURUS RELOAD.

=> D QUE L50

L32 553 SEA FILE=WPIX ABB=ON COMPOSITE?(3A)POLYMER?(3A)METAL?
L33 71 SEA FILE=WPIX ABB=ON L32 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER)
L34 2 SEA FILE=WPIX ABB=ON L33 AND (NONNOBLE OR (NON OR NONE) (1A)NOB
LE)
L39 58 SEA FILE=WPIX ABB=ON L33 AND (FE OR IRON OR FERRIC OR FERROUS
OR NI OR NICKEL OR CARBON OR C OR HG OR MERCURY OR AL OR CU OR
COPPER OR ALUMINUM OR ALUMINIUM)
L40 4 SEA FILE=WPIX ABB=ON L39 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER) (2A) (COAT?
OR CLAD?)
L41 6 SEA FILE=WPIX ABB=ON L34 OR L40
L45 66 SEA FILE=COMPENDEX ABB=ON L32 AND (NOBLE OR PRECIOUS OR AU OR
GOLD OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER)
L47 0 SEA FILE=COMPENDEX ABB=ON L45 AND (NOBLE OR PRECIOUS OR AU OR
GOLD OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER) (2A) (COAT?
OR CLAD?)
L50 0 SEA FILE=JICST-EPLUS ABB=ON L41 OR L47

=> FILE JAPIO

FILE 'JAPIO' ENTERED AT 13:06:59 ON 16 APR 2004
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FILE LAST UPDATED: 8 APR 2004 <20040408/UP>
FILE COVERS APR 1973 TO DECEMBER 05, 2003

<<< GRAPHIC IMAGES AVAILABLE >>>

=> D QUE L49

L32 553 SEA FILE=WPIX ABB=ON COMPOSITE?(3A)POLYMER?(3A)METAL?
L33 71 SEA FILE=WPIX ABB=ON L32 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER)
L34 2 SEA FILE=WPIX ABB=ON L33 AND (NONNOBLE OR (NON OR NONE) (1A)NOB
LE)
L39 58 SEA FILE=WPIX ABB=ON L33 AND (FE OR IRON OR FERRIC OR FERROUS
OR NI OR NICKEL OR CARBON OR C OR HG OR MERCURY OR AL OR CU OR
COPPER OR ALUMINUM OR ALUMINIUM)
L40 4 SEA FILE=WPIX ABB=ON L39 AND (NOBLE OR PRECIOUS OR AU OR GOLD
OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER) (2A) (COAT?
OR CLAD?)
L41 6 SEA FILE=WPIX ABB=ON L34 OR L40
L45 66 SEA FILE=COMPENDEX ABB=ON L32 AND (NOBLE OR PRECIOUS OR AU OR
GOLD OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER)
L47 0 SEA FILE=COMPENDEX ABB=ON L45 AND (NOBLE OR PRECIOUS OR AU OR
GOLD OR PT OR PD OR PLATINUM OR PALLADIUM OR AG OR SILVER) (2A) (COAT?
OR CLAD?)
L49 0 SEA FILE=JAPIO ABB=ON L41 OR L47

=> DUP REM L30 L41

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 PROCESSING COMPLETED FOR L41
L51 50 DUP REM L30 L41 (1 DUPLICATE REMOVED)

=> D L51 ALL 1-50

L51 ANSWER 1 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
 AN 2004:119573 HCAPLUS
 DN 140:147734
 ED Entered STN: 13 Feb 2004
 TI Novel electrically active **ionic polymer metal composites** and novel methods of manufacturing them
 IN Shahinpoor, Mohsen; Ahghar, Massoud; Popa, Niculina Cristina
 PA Environmental Robots Inc., USA
 SO U.S. Pat. Appl. Publ., 8 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 IC ICM C25D015-00
 NCL 075722000; 205109000
 CC 42-2 (Coatings, Inks, and Related Products)
 FAN.CNT 1

applicants

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004025639	A1	20040212	US 2002-64729	20020809
PRAI	US 2002-64729		20020809		

AB Novel **ionic polymer metal composites**
 is manufactured by means of an innovative chemical depositing process,
 comprising
 the steps of: first depositing **none noble metal salt cations** inside a **cationic ionic polymer** mol. network followed by chemical reduction of the the **none noble metal salt cations** to generate reduced **none noble metal** particles deposited inside the **polymeric** mol. network and the outside surfaces of the **polymeric** material, like outside **metallic** electrodes, followed by a second electro or chemo deposition and plating of a **noble metal** inside and on surfaces of the the reduced **none noble metal** particles in the the **polymer** mol. network to protect the first the **none noble metal** particles from oxidation, corrosion and chemical degradation for prolonged sensing and actuation applications of the the novel **ionic polymer metal composite** material which generates an elec. signal with mech. deformation and undergoes mech. deformation if an elec. field is imposed on it.

ST novel elec active **ionic polymer metal composite**

IT Polyelectrolytes
 (cationic; novel elec. active **ionic polymer metal composites** and novel methods of manufacturing them)

IT Coating process
 Electrodeposition
 Vapor deposition process
 (chemical; novel elec. active **ionic polymer metal composites** and novel methods of manufacturing them)

IT **Composites**
(novel elec. active **ionic polymer metal**
composites and novel methods of manufacturing them)

IT **Metals**, miscellaneous
RL: MSC (Miscellaneous)
(novel elec. active **ionic polymer metal**
composites and novel methods of manufacturing them)

IT **Ionic** conductors
(**polymeric**; novel elec. active **ionic**
polymer metal composites and novel methods
of manufacturing them)

L51 ANSWER 2 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:308059 HCAPLUS
DN 139:86004
ED Entered STN: 23 Apr 2003
TI Comparative experimental study of **ionic polymer-**
metal composites with different backbone ionomers and in
various **cation** forms
AU Nemat-Nasser, Sia; Wu, Yongxian
CS Cent. Excellence Adv. Mater., University of California, San Diego, La
Jolla, CA, 92093-0416, USA
SO Journal of Applied Physics (2003), 93(9), 5255-5267
CODEN: JAPIAU; ISSN: 0021-8979
PB American Institute of Physics
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 76
AB An **ionic polymer-metal composite**
(IPMC) consisting of thin perfluorinated ionomer (Nafion or Flemion)
strip, **platinum**, and/or **gold** plated on both faces and
cations, undergoes large bending motion when, in a hydrated state,
a small elec. field is applied across its thickness. When the same
membrane is suddenly bent, a small voltage of the order of millivolts is
produced across its surfaces. Hence, IPMCs can serve as soft bending
actuators and sensors. This coupled elec.-chemical-mech. response of IPMCs
depends on the structure of the backbone ionomer, the morphol. and conductivity
of the **metal** electrodes, the nature of the **cations**,
and the level of hydration (or other solvent uptake). Studies on both
Nafion- and Flemion-based IPMCs in various **cation** forms were
studied to elucidate fundamental properties of these **composites**,
to explore the actuation mechanism, and to optimize their performance for
various potential applications. Compared with Nafion-based IPMCs,
Flemion-based IPMCs with fine dendritic **gold** electrodes have
higher ion-exchange capacity, better surface conductivity, higher hydration
capacity, and higher longitudinal stiffness. They also display greater
bending actuation under the same applied voltage. In addition, they do not
display reverse relaxation under sustained d.c. voltage, which is typical
of Nafion-based IPMCs in alkali-**metal** form. Flemion IPMCs thus
are promising **composites** for application as bending actuators.

ST fluoropolymer ionomer **platinum** membrane bending elec field;
actuator fluoropolymer ionomer bending surface cond

IT Polyoxyalkylenes, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP
(Physical process); TEM (Technical or engineered material use); PROC
(Process); USES (Uses)
(fluorine- and sulfo-containing, ionomers, Nafion and Flemion; surface
conductivity and actuation mechanism of metal **cation** - fluoropolymer

- ionomer composites toward use as actuators and sensors)
- IT Fluoropolymers, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, Nafion and Flemion; surface conductivity and actuation mechanism of metal **cation** - fluoropolymer ionomer composites toward use as actuators and sensors)
- IT Ionomers
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, Nafion and Flemion; surface conductivity and actuation mechanism of metal **cation** - fluoropolymer ionomer composites toward use as actuators and sensors)
- IT Actuators
Electric capacitance
Electrostriction
Film electrodes
Ion exchange
Stiffness
Surface conductivity
(surface conductivity and actuation mechanism of metal **cation** - fluoropolymer ionomer composites toward use as actuators and sensors)
- IT Ionomers
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(surface conductivity and actuation mechanism of metal **cation** - fluoropolymer ionomer composites toward use as actuators and sensors)
- IT Polymer morphology
(surface; surface conductivity and actuation mechanism of metal **cation** - fluoropolymer ionomer composites toward use as actuators and sensors)
- IT 7440-06-4, **Platinum**, properties 7440-09-7, Potassium, properties 7440-23-5, Sodium, properties 7440-46-2, Cesium, properties 7440-57-5, **Gold**, properties 10549-76-5, Tetrabutylammonium 66796-30-3, Nafion 117
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(surface conductivity and actuation mechanism of metal **cation** - fluoropolymer ionomer composites toward use as actuators and sensors)

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Bar-Cohen, Y; Proc SPIE 2000, V3987, P140 HCAPLUS
- (2) Bar-Cohen, Y; Proc SPIE 2001, V4329, P319 HCAPLUS
- (3) Heitner-Wirquin, C; J Membr Sci 1996, V120, P1 HCAPLUS
- (4) Hsu, W; J Membr Sci 1983, V13, P307 HCAPLUS
- (5) Kazuo, O; Electrochim Acta 2000, V46, P737
- (6) Kazuo, O; Electrochim Acta 2001, V46, P1233
- (7) Keisuke, O; Proc SPIE 1999, V3669, P64
- (8) Kinji, A; J Electroanal Chem 2001, V505, P24
- (9) Kiran, M; J Intell Mater Syst Struct 2001, V12, P143
- (10) McGee, J; Ph D dissertation, University of California 2002
- (11) Mohsen, S; Smart Mater Struct 2000, V9, P543
- (12) Mohsen, S; Smart Mater Struct 2001, V10, P819
- (13) Naoko, F; Chem Mater 2000, V12, P1750
- (14) Nemat-Nasser, S; Electroactive Polymer (EAP) Actuators as Artificial Muscles-Reality, Potential and Challenges, Chap 6 2001, P139

- (15) Nemat-Nasser, S; J Appl Phys 2000, V87, P3321 HCAPLUS
- (16) Nemat-Nasser, S; J Appl Phys 2002, V92, P2899 HCAPLUS
- (17) Newbury, K; Proc SPIE 2002, V4695, P67 HCAPLUS
- (18) Xiaqi, B; Proc SPIE 2002, V4695, P220

L51 ANSWER 3 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2003:727580 HCAPLUS

DN 140:9551

ED Entered STN: 17 Sep 2003

TI Selective Interactive Grafting of Composite Bifunctional Electrocatalysts for Simultaneous Anodic Hydrogen and CO Oxidation

AU Neophytides, S. G.; Zafeiratos, S. H.; Jaksic, M. M.

CS Institute of Chemical Engineering and High Temperature Chemical Processes, Forth, Greece

SO Journal of the Electrochemical Society (2003), 150(10), E512-E526

CODEN: JES0AN; ISSN: 0013-4651

PB Electrochemical Society

DT Journal; General Review

LA English

CC 72-0 (Electrochemistry)

Section cross-reference(s): 67, 78

AB A review with refs. concerning selective interactive grafting of **composite** bifunctional electrocatalysts for simultaneous anodic hydrogen and CO oxidation is presented. The equivalence of interionic hypo-hyper-d-interelectronic interaction (HHDII) in both **metallic** and any other **ionic** state and its effect upon electrocatalytic properties for hydrogen electrode reactions has been proved and inferred. Thermal gravimetry (TG) anal. of temperature programmed reduction (TPR) of mixed

hypo-hyper-d-electronic oxides of transition elements was broadly employed to prove the interionic bonding effect (the extended Brewer theory) as reflected in dramatically decreased individual temps. of their mutual reduction into intermetallic phases or alloys. The same interionic (and/or intermetallic) bonding effect has been confirmed both by under potential deposition of hyper-d- upon hypo-d-electronic substrates and vice versa, and by the shift of bonding peaks in XPS anal. The former affords the basis for new trends in submonolayer hypo-hyper-d-interelectronic electrocatalysis of transition **metals**. Strong **metal** support interaction (SMSI) of both individual and **composite**, prevaillingly hyper-d-electronic **metallic** electrocatalysts upon individual and/or **composite**, usually hypo-d-electronic oxide substrates have been employed to create and graft (anchor) bifunctional electrocatalysts for simultaneous anodic hydrogen and CO oxidation in low temperature **polymer** exchange membrane fuel cells. The selective interionic bonding method upon predestined active centers of hypo-d-electronic oxide supports has been adapted to avoid nanostructured colloidal precursors and directly graft (anchor) a priori defined nanosized intermetallic phases and synergetic bifunctional electrocatalysts from decomposition of corresponding stoichiometric mixts. of various individual or intermetallic acetylacetonates. An adapted TG method based on TPR has been properly used to define, control and/or stimulate the homogeneity of the intermetallic crystal bonding and growth of nanostructured **composite** catalysts, mostly of rather extra strong bonding Brewer intermetallic phases upon proper SMSI oxide supports. Thus, it has been pointed out that the term SMSI has a broader HHDII sense in both the bonding effectiveness and bifunctional catalytic meaning, and in fact stays in the core of such extended Brewer interionic bonding theory.

ST review selective interactive grafting composite bifunctional

electrocatalysts; simultaneous anodic hydrogen carbon monoxide oxidn
bifunctional electrocatalysts review

- IT Catalysts
(electrocatalysts; selective interactive grafting of composite
bifunctional electrocatalysts for simultaneous anodic hydrogen and CO
oxidation)
- IT Transition metals, properties
RL: PRP (Properties)
(interionic hypo-hyper-d-interelectronic interaction in both metallic
and any other ionic state for oxide of)
- IT Cyclic voltammetry
(of **Pt** and **Au** electrodes in KOH solution containing
formaldehyde)
- IT Thermogravimetric analysis
X-ray photoelectron spectra
(of mixture of Mo-**Ni** oxides in hydrogen stream)
- IT Sol-gel processing
(preparation of interionic hypo-hyper-d-interelectronic metal oxide catalyst
by)
- IT Composites
Oxidation, electrochemical
(selective interactive grafting of composite bifunctional
electrocatalysts for simultaneous anodic hydrogen and CO oxidation)
- IT 17272-66-1, Acetylacetonate, reactions
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(intermetallic; use preparation of interionic hypo-hyper-d-interelectronic
metal oxide catalyst by)
- IT 1313-27-5P, Molybdenum trioxide, uses 12036-10-1P, Ruthenium dioxide
13463-67-7P, Titania, uses
RL: CAT (Catalyst use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)
(preparation of interionic hypo-hyper-d-interelectronic metal oxide catalyst
by sol-gel processing)
- IT 630-08-0, Carbon monoxide, reactions 1333-74-0, Hydrogen, reactions
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(selective interactive grafting of composite bifunctional
electrocatalysts for simultaneous anodic hydrogen and CO oxidation)
- IT 10141-05-6, Cobalt nitrate 12027-67-7 13138-45-9, **Nickel**
nitrate 67092-84-6, Tungsten trioxide monohydrate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(use in preparation of interionic hypo-hyper-d-interelectronic metal oxide
catalyst by sol-gel processing)

RE.CNT 108 THERE ARE 108 CITED REFERENCES AVAILABLE FOR THIS RECORD
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- L51 ANSWER 4 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:632191 HCAPLUS
ED Entered STN: 15 Aug 2003
TI Tailoring actuation of **ionic polymer metal composites** through **cation** combination
AU Nemat-Nasser, Siavouche; Wu, Yongxian
CS Center of Excellence for Advanced Materials, Univ. of California, San Diego, CA, 92093, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (2003), 5051(Electroactive Polymer Actuators and Devices (EAPAD)), 245-253
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal

LA English

CC 76 (Electric Phenomena)

AB An **ionic polymer-metal composite**

(IPMC) consisting of a thin perfluorinated ionomer (usually, Nafion® or Flemion®) strip, **platinum** and/or **gold** plated on both faces, undergoes large bending motion when a small elec. field is applied across its thickness. When the same membrane is suddenly bent, a small elec. potential of the order of millivolts is produced across its surfaces. This actuation and sensing response depends on the structure of the ionomer, the morphol. of the **metal** electrodes, the nature of **cations**, and the level of hydration. IPMCs in alkali-**metal cation** form under d.c. (DC) show a fast motion towards the anode, followed by a slow relaxation. For Nafion-based IPMCs, this slow relaxation is towards the cathode, whereas for Flemion-based IPMCs, the slow relaxation continues the initial fast motion towards the anode. In contrast, the actuation of both Nafion- and Flemion-based IPMCs in tetrabutylammonium (TBA+) **cation** form consists of a continuous slow motion towards the anode. We have discovered that when an IPMC is neutralized by combined Na+ and TBA+ **cations** to produce a suitable Na-TBA-form membrane, different actuation behavior results. The proportion of the **cations** can be tailored to obtain a desired actuation response, e.g., to control the duration, speed, and the maximum amplitude of the initial motion towards the anode, or the magnitude and the speed of the subsequent relaxation. A series of **cation** combination tests on both Nafion- and Flemion-based IPMCs are carried out. Various essential phys. properties of the IPMCs in various **cation** compns. are measured and compared. A summary of these results is presented.

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L51 ANSWER 5 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2003:632190 HCAPLUS

ED Entered STN: 15 Aug 2003

TI Experimental study of Nafion- and Flemion-based **ionic polymer metal composites** (IPMCs) with ethylene glycol as solvent

AU Nemat-Nasser, Siavouche; Zamani, Shahram

CS Center of Excellence for Advanced Materials, Univ. of California, San Diego, CA, 92093, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (2003), 5051(Electroactive Polymer Actuators and Devices (EAPAD)), 233-244
CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 38 (Plastics Fabrication and Uses)

AB **Ionic polymer-metal composites**

(IPMCs) consist of a perfluorinated ionomer membrane (usually Nafion® or Flemion®) plated on both faces with a **noble metal** such as **gold** or **platinum** and neutralized with a

certain amount of counterions that balance the elec. charge of anions covalently fixed to the membrane backbone. IPMCs are electroactive materials that can be used as actuators and sensors. Their elec.-chemical-mech. response is highly dependent on the **cations** used, the solvent, the amount of solvent uptake, the morphol. of the electrodes, and other factors. With water as the solvent, the applied elec. potential must be limited to less than 1.3V at room temperature, to avoid electrolysis. Moreover, water evaporation in open air presents addnl. problems. These and related factors limit the application of IPMCs with water as the solvent. Ethylene glycol has a viscosity of about 16 times that of water at room temperature, and has a greater mol. weight. It is used

as an

anti-freeze. Like water, it consists of polar mols. and thus can serve as a solvent for IPMCs. We present the results of a series of tests on both Nafion- and Flemion-based IPMCs with ethylene glycol as the solvent, and compare these with the results obtained using water. IPMCs with ethylene glycol as their solvent have greater solvent uptake, and can be subjected to relatively high voltages without electrolysis. They can be actuated in open air for rather long time periods, and at low temps. They may be good actuators when high-speed actuation is not necessary.

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L51 ANSWER 6 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2003:283865 HCAPLUS

DN 139:44563

ED Entered STN: 13 Apr 2003

TI Research on the contact resistance, reliability, and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications

AU Zhang, J. H.; Chan, Y. C.

CS School of Mechatronic Engineering and Automation, Shanghai University, Shanghai, 200072, Peop. Rep. China

SO Journal of Electronic Materials (2003), 32(4), 228-234

CODEN: JECMA5; ISSN: 0361-5235

PB Minerals, Metals & Materials Society

DT Journal

LA English

CC 76-1 (Electric Phenomena)

Section cross-reference(s): 56

AB Although there have been many years of development, the degradation of the elec. performance of anisotropically conductive adhesive or film (ACA or ACF) interconnection for flip-chip assembly is still a critical drawback despite wide application. In-depth study about the reliability and degradation mechanism of ACF interconnection is necessary. In this paper, the initial contact resistance, elec. performance after reliability tests, and degradation mechanisms of ACF interconnection for flip-chip-on-flex (FCOF)

assembly were studied using very-low-height Ni and **Au-coated** Ni-bumped chips. The combination of ACF and very-low-height bumped chips was considered because it has potential for very low cost and ultrafine pitch interconnection. Contact resistance changes were monitored during reliability tests, such as high humidity and temperature and thermal cycling. The high, initial contact resistance resulted from a thin oxide layer on the surface of the bumps. The reliability results showed that the degradation of elec. performance was mainly related to the oxide formation on the surface of deformed particles with **non-noble metal coating**, the severe metal oxidation on the conductive surface of bumps, and coefficient of thermal expansion (CTE) mismatch between the ACF adhesive and the contact conductive-surface metalization. Some methods for reducing initial contact resistance and improving ACF interconnection reliability were suggested. The suggestions include the removal of the oxide layer and an increase of the **Au-coating** film to improve conductive-surface quality, appropriate choice of conductive particle, and further development of better **polymeric** adhesives with low CTE and high elec. performance.

ST contact resistance anisotropic conduction film interconnect flip chip flex
IT Electric conductors

(anisotropic; research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

IT Adhesives

(conductive; research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

IT Anisotropic materials

(elec. conductors; research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

IT Interconnections, electric

(flip-chip-on-flex; research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

IT Coating process

(metalization, on nickel bump contacts; research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

IT Bump contacts

(nickel; research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

IT Contact resistance

(research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

IT Thermal cycling

(weathering test by; research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

IT 7440-02-0, Nickel, properties

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(bump contact, for chips; research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

IT 7440-57-5, Gold, properties

RL: DEV (Device component use); MOA (Modifier or additive use); PRP (Properties); USES (Uses)

(coating on nickel contacts; research on contact resistance, reliability and degradation mechanisms of anisotropically conductive film interconnection for flip-chip-on-flex applications)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L51 ANSWER 7 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2002:658388 HCAPLUS

DN 137:193767

ED Entered STN: 30 Aug 2002

TI **Precious metal clad Ni/C**
conductive fillers and conductive polymers
made therefrom

IN Hajmrle, Karel; Zhang, Jones Y.; Callen, Brian William

PA The Westaim Corporation, Can.

SO PCT Int. Appl., 16 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM H01B001-22

ICS H01B001-24

CC 76-2 (Electric Phenomena)

Section cross-reference(s): 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002067274	A2	20020829	WO 2002-CA178	20020214
	W:				
	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW:				
	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	US 2002160193	A1	20021031	US 2001-788435	20010221
PRAI	US 2001-788435	A	20010221		
AB	There is a provided a particulate conductive filler which				

comprises a **noble** metal **coating** formed over a **nonnoble** metal coating over an inner **C**-based core. The **conductive** filler is used in conjunction with a **polymer** matrix to form **composite** materials for **conductive** applications.

ST **precious metal** clad nickel **carbon**
conductive filler **polymer**

IT **Noble** metals

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(-clad nickel/carbon **conductive** fillers
and **polymers**)

IT **Carbon** black, uses

RL: DEV (Device component use); USES (Uses)

(**precious metal**-clad **conductive** fillers
and **polymers** containing nickel and)

IT **Conducting polymers**

(**precious metal**-clad nickel/carbon)

IT **Fillers**

(**precious metal**-clad nickel/carbon
conductive)

IT **Polymers**, uses

Polysiloxanes, uses

RL: DEV (Device component use); USES (Uses)

(**precious metal**-clad nickel/carbon
conductive)

IT **Composites**

(**precious metal**-clad nickel/carbon
conductive fillers and **polymers**)

IT 7439-88-5, Iridium, uses 7440-05-3, **Palladium**, uses

7440-06-4, **Platinum**, uses 7440-16-6, Rhodium, uses

7440-22-4, Silver, uses 7440-57-5, **Gold**, uses

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(-clad nickel/carbon **conductive** fillers
and **polymers**)

IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-31-5, Tin, uses

7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-66-6, Zinc, uses

RL: DEV (Device component use); USES (Uses)

(**precious metal**-clad **conductive** fillers
and **polymers** containing **carbon** and)

IT 7440-44-0, **Carbon**, uses 7782-42-5, Graphite, uses

RL: DEV (Device component use); USES (Uses)

(**precious metal**-clad **conductive** fillers
and **polymers** containing nickel and)

L51 ANSWER 8 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2002:901015 HCAPLUS

DN 137:371179

ED Entered STN: 27 Nov 2002

TI Polymeric materials for gas barrier films

IN Takagi, Toshihiko; Tanabe, Masaru; Haga, Yasuhiko

PA Mitsui Chemicals Inc., Japan

SO Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08L101-00

ICS C08J005-18; C08K003-00; C08K005-09

CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 17, 42

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002338821	A2	20021127	JP 2001-148023	20010517
PRAI	JP 2001-148023		20010517		

AB Title materials comprise low water soluble inorg. fine particles with average particle diameter ≤ 500 nm and **polymer** compds., where the inorg. fine particles are **ionic** crystals of nonlayered structures obtained from reaction products of ≥ 1 inorg. compds. or mixts. selected from group II atom, **Al**, Si, 4th period transition **metal**, Zn, Zr, **Ag**, and Sn and ≥ 1 compds. selected from organic acids, inorg. acids, and their salts. Thus, 66.49 g 15.04% aqueous KM 118 carboxyl group modified PVA and 7.375 g calcium hydroxide were stirred, 55.6 g 10.5% aqueous phosphoric acid was added therein to give a 50:50 poly(vinyl alc.)/calcium phosphate dispersion (solid content 5.2% and average particle diameter 78 nm) showing no layered structure, concentrated 10%-solids of the resulting dispersion was applied on an adhesive layer coated A-4100 film, dried at 110° for 4 min to give a transparent PVA/calcium phosphate **composite** coated film with oxygen permeability 0.7 cm³/m²-day-atm at 65% RH.

ST polymeric material gas barrier film; PVA calcium phosphate composite film
prepn oxygen barrier

IT Polyesters, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(base film; preparation of poly(vinyl alc.)/calcium phosphate composite gas barrier films)

IT Food packaging materials

(gas impermeable; preparation of polymer/calcium phosphate composite gas barrier films)

IT Coating materials

(gas-impermeable; preparation of polymer/calcium phosphate composite gas barrier films)

IT Polymers, uses

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)

(water-soluble; preparation of poly(vinyl alc.)/calcium phosphate composite gas barrier films)

IT 25038-59-9, A 4100, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(base film; preparation of poly(vinyl alc.)/calcium phosphate composite gas barrier films)

IT 10103-46-5P, Calcium phosphate

RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)

(preparation of poly(vinyl alc.)/calcium phosphate composite gas barrier films)

IT 9002-89-5D, Poly(vinyl alcohol), carboxyl group-modified 111214-41-6, KM 118

RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(preparation of poly(vinyl alc.)/calcium phosphate composite gas barrier films)

IT 9002-89-5, Poly(vinyl alcohol)

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)

(preparation of poly(vinyl alc.)/calcium phosphate composite gas barrier films)

films)
 IT 9004-34-6D, Cellulose, derivs.
 RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (preparation of polymer/calcium phosphate composite gas barrier films)
 IT 9002-85-1, Poly(vinylidene chloride) 9003-01-4, Poly(acrylic acid)
 9003-01-4D, Poly(acrylic acid), salts 9003-05-8, Polyacrylamide
 25014-12-4, Polymethacrylamide 25014-41-9, Polyacrylonitrile
 25067-34-9, Ethylene-vinyl alcohol copolymer
 RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
 (preparation of polymer/calcium phosphate composite gas barrier films)
 IT 1305-62-0, Calcium hydroxide, reactions 7664-38-2, Phosphoric acid, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reactant in calcium phosphate preparation; preparation of poly(vinyl alc.)/calcium phosphate composite gas barrier films)

L51 ANSWER 9 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2002:366947 HCAPLUS

DN 136:373488

ED Entered STN: 16 May 2002

TI Ceramic composite manufactured by depositing ceramic/metal nanoparticles accompanied with polymer pyrolysis

IN Aichele, Wilfried; Dressler, Wolfgang; Rau, Christof; Knoblauch, Volker; Klonczynski, Alexander; Boeder, Horst

PA Robert Bosch Gmbh, Germany

SO Ger. Offen., 6 pp.

CODEN: GWXXBX

DT Patent

LA German

IC ICM C04B035-00

ICS C04B038-00

CC 57-2 (Ceramics)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 10055082	A1	20020516	DE 2000-10055082	20001107
	WO 2002038520	A2	20020516	WO 2001-DE4110	20011105
	WO 2002038520	A3	20021121		
	W: JP, KR, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	EP 1339652	A2	20030903	EP 2001-993592	20011105
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
	US 2003092557	A1	20030515	US 2002-169662	20021029
PRAI	DE 2000-10055082	A	20001107		
	WO 2001-DE4110	W	20011105		
AB	The ceramic composite, in particular a ceramic molded shape or a layer, is manufactured by pyrolysis of an output mixture, which contains at least a polymer precursor material and ≥ 1 filler having an average particle size of ≤ 200 Nm, preferably 5-80 nm. The fillers are selected from oxides, borides, nitrides, or carbides of Si, Al, Ti, Zr, B, W, V, Hf, Nb, Ta, or Mo, or their mixts. in the from of oxycarbides, oxynitrides, carbonitrides, and oxycarbonitrides. The fillers may also contain nanoparticles of Au, Pd, Pt, Rh, Ir, carbon, and silica or pyrogenic silicic acid. The composite matrix has nanoscale				

porous structure having open porosity of 1-50%. Polymer precursors are selected from polysiloxane, polysilane, polycarbosilane, polysilazane, or organometallic polymers such as Zr-containing, Al-containing, Ti-containing, or B-containing polymers. A such composite is suitable for the production of fibers,

filters, ceramic catalyst substrate materials, ceramic heater plugs, metal-containing reaction composites, porous protective covers for sensors or as lightwt. material.

ST ceramic composite polymer pyrolysis fiber filter catalyst; polysiloxane polysilane metal ceramic matrix composite

IT Catalysts
Electric **conductivity**
Lightweight materials
Sensors
(ceramic porous **composites**; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with **polymer** pyrolysis)

IT Filters
(ceramic, ceramic porous **composites**; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with **polymer** pyrolysis)

IT Synthetic fibers
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(ceramic, ceramic porous **composites**; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with **polymer** pyrolysis)

IT Nanoparticles
(ceramic/metals; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with polymer pyrolysis)

IT Ceramics
(filters, ceramic porous **composites**; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with **polymer** pyrolysis)

IT Ceramic **composites**
(**metal**-ceramic **composites**; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with **polymer** pyrolysis)

IT Polymers, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(metal-containing, precursors; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with polymer pyrolysis)

IT Borides
Carbides
Nitrides
Oxides (inorganic), uses
Oxynitrides
RL: TEM (Technical or engineered material use); USES (Uses)
(nanoparticles; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with polymer pyrolysis)

IT Porosity
(nanoscale; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with polymer pyrolysis)

IT Carbides
Oxides (inorganic), uses
RL: TEM (Technical or engineered material use); USES (Uses)
(oxycarbides, nanoparticles; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with polymer pyrolysis)

IT Polycarbosilanes
Polysilanes
Polysiloxanes, processes
Silazanes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polymer precursors; ceramic composite manufactured by depositing ceramic/metal nanoparticles accompanied with polymer pyrolysis)

IT **Polymer** degradation
(thermal, ceramic **composites** manufactured by; ceramic composite manufactured by depositing ceramic/**metal** nanoparticles accompanied with **polymer** pyrolysis)

IT 409-21-2, Silicon carbide, uses 1344-28-1, Alumina, uses 12136-78-6, Molybdenum disilicide
RL: TEM (Technical or engineered material use); USES (Uses)
(filler, nanoparticles; ceramic composite manufactured by depositing ceramic/metal nanoparticles accompanied with polymer pyrolysis)

IT 1343-98-2, Silicic acid 7439-88-5, Iridium, uses 7440-05-3, **Palladium**, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-44-0, **Carbon**, uses 7440-57-5, Gold, uses 7631-86-9, Silica, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(nanoparticles; ceramic composite manufactured by depositing ceramic/metal nanoparticles accompanied with polymer pyrolysis)

IT 9004-73-3, Polymethylsiloxane
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polymer precursors; ceramic composite manufactured by depositing ceramic/metal nanoparticles accompanied with polymer pyrolysis)

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Anon; EP 0536866 B1 HCAPLUS
(2) Anon; DE 19538695 A1 HCAPLUS

L51 ANSWER 10 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:915359 HCAPLUS
DN 138:188563
ED Entered STN: 03 Dec 2002
TI Mechanical characteristics of **ionic polymer-metal composite** in the process of self-bending
AU Tamagawa, Hirohisa; Yagasaki, Kazuyuki; Nogata, Fumio
CS Department of Human and Information Systems, Gifu University, Gifu, Gifu, 501-1193, Japan
SO Journal of Applied Physics (2002), 92(12), 7614-7618
CODEN: JAPIAU; ISSN: 0021-8979
PB American Institute of Physics
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 56

AB An **ionic polymer-metal composite** (IPMC) consisting of a thin Nafion sheet sandwiched between 2 thin **metallic** plates like **platinum**, **silver**, and **copper** ones exhibits a large self-bending motion in its transversal direction upon such a small voltage as 1 V. Estimating Young's moduli and generated force, which are time dependent and difficult to measure by standard methods, is fundamental for understanding their mech.

properties. The authors propose a simple method to estimate the time-dependent nominal Young's moduli and generated force in expts. The authors use cantilever beams of IPMCs and obtain their Young's moduli and generated force (bending moments) from their shapes and vertical force at the tips by neglecting their inertia and viscosity property. The validity of the method is demonstrated by numerical simulation results. For an IPMC consisting of a Nafion sheet and 2 thin **silver** plates the authors give exptl. results, which are considerably consistent with ones previously reported. Moreover, they see that its Young's modulus and generated force have large variations in the process of its self-bending.

ST ionomer metal composite selfbending elastic modulus

IT Polyoxyalkylenes, properties

RL: PRP (Properties)

(fluorine- and sulfo-containing, ionomers, Nafion; mech. characteristics of **ionic polymer-metal composite** in process of self-bending)

IT Simulation and Modeling, physicochemical

Young's modulus

(mech. characteristics of **ionic polymer-metal composite** in process of self-bending)

IT Fluoropolymers, properties

RL: PRP (Properties)

(polyoxyalkylene-, sulfo-containing, ionomers, Nafion; mech. characteristics of **ionic polymer-metal composite** in process of self-bending)

IT Ionomers

RL: PRP (Properties)

(polyoxyalkylenes, fluorine- and sulfo-containing, Nafion; mech. characteristics of **ionic polymer-metal composite** in process of self-bending)

IT Bending

(self-; mech. characteristics of **ionic polymer-metal composite** in process of self-bending)

IT 7440-06-4, **Platinum**, properties 7440-22-4, **Silver**, properties 7440-50-8, **Copper**, properties

RL: PRP (Properties)

(mech. characteristics of **ionic polymer-metal composite** in process of self-bending)

RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L51 ANSWER 11 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2002:625253 HCAPLUS

DN 137:370953

ED Entered STN: 20 Aug 2002

TI Micromechanics of actuation of **ionic polymer-metal composites**

AU Nemat-Nasser, Sia

CS Center of Excellence for Advanced Materials, University of California, San Diego, La Jolla, CA, 92093-0416, USA

SO Journal of Applied Physics (2002), 92(5), 2899-2915

CODEN: JAPIAU; ISSN: 0021-8979

PB American Institute of Physics

DT Journal

LA English

CC 38-3 (Plastics Fabrication and Uses)

AB **Ionic polymer-metal composites**

(IPMCs) consist of a polyelectrolyte membrane (usually, Nafion or Flemion) plated on both faces by a **noble metal**, and is neutralized with certain counter ions that balance the elec. charge of the anions covalently fixed to the backbone membrane. In the hydrated state (or in the presence of other suitable solvents), the **composite** is a soft actuator and sensor. Its coupled elec.-chemical-mech. response depends on: (1) the chemical composition and structure of the backbone **ionic polymer**; (2) the morphol. of the **metal** electrodes; (3) the nature of the **cations**; and (4) the level of hydration (solvent saturation). A systematic exptl. evaluation of the mech. response of both **metal**-plated and bare Nafion and Flemion in various **cation** forms and various water saturation levels has been performed in the author's labs. at the University of California, San Diego. By examining the measured stiffness of the Nafion-based **composites** and the corresponding bare Nafion, under a variety of conditions, I have sought to develop relations between internal forces and the resulting stiffness and deformation of this class of IPMCs. Based on these and through a comparative study of the effects of various **cations** on the material's stiffness and response, I have attempted to identify potential micromechanisms responsible for the observed electromech. behavior of these materials, model them, and compare the model results with exptl. data. A summary of these developments is given in the present work. First, a micromech. model for the calcn. of the Young modulus of the bare Nafion or Flemion in various ion forms and water saturation levels is given. Second, the bare-**polymer** model is modified to include the effect of the **metal** plating, and the results are applied to calculate the stiffness of the corresponding IPMCs, as a function of the solvent uptake. Finally, guided by the stiffness modeling and data, the actuation of the Nafion-based IPMCs is micromechanically modeled. Examples of the model results are presented and compared with the measured data.

ST micromechanic actuation **ionic polymer metal**

composite; Nafion **platinum gold** plated

membrane neutralized counterion Young modulus; sensor actuator Nafion

platinum gold plated membrane

IT Actuators

Diffusion

- Dipole
Electric charge
Sensors
Simulation and Modeling, physicochemical
Stiffness
Young's modulus
 (micromechanics of actuation of **ionic polymer-metal composite** consisting of **Au-** or **Pt-** plated Nafion membrane neutralized with counter ions)
- IT Fluoropolymers, uses
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (micromechanics of actuation of **ionic polymer-metal composite** consisting of **Au-** or **Pt-** plated Nafion membrane neutralized with counter ions)
- IT Coating process
 (plating; micromechanics of actuation of **ionic polymer-metal composite** consisting of **Au-** or **Pt-** plated Nafion membrane neutralized with counter ions)
- IT 7439-93-2, Lithium, uses 7440-17-7, Rubidium, uses 10549-76-5, Tetrabutyl ammonium
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (counter ion; micromechanics of actuation of **ionic polymer-metal composite** consisting of **Au-** or **Pt-** plated Nafion membrane neutralized with counter ions)
- IT 66796-30-3, Nafion 117
 RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)
 (micromechanics of actuation of **ionic polymer-metal composite** consisting of **Au-** or **Pt-** plated Nafion membrane neutralized with counter ions)
- IT 7440-06-4, **Platinum**, uses 7440-57-5, **Gold**, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (micromechanics of actuation of **ionic polymer-metal composite** consisting of **Au-** or **Pt-** plated Nafion membrane neutralized with counter ions)
- RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
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- L51 ANSWER 12 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:394733 HCAPLUS
DN 137:191922
ED Entered STN: 28 May 2002
TI Electrochemical characterization of polymer actuator with large interfacial area
AU Noh, Tae-Geun; Tak, Yongsug; Nam, Jae-Do; Choi, Hyoukryeol
CS Department of Chemical Engineering, Inha University, Inchon, 402-751, S. Korea
SO Electrochimica Acta (2002), 47(13-14), 2341-2346
CODEN: ELCAAV; ISSN: 0013-4686
PB Elsevier Science Ltd.
DT Journal
LA English
CC 72-2 (Electrochemistry)
Section cross-reference(s): 38, 56
AB Actuating and electrochem. behaviors of nafion-based electrode were strongly dependent on the interfacial area between the electrode and the **polymer** electrolyte. A replication method was utilized to manufacture a large surface-area **composite** actuator. Measurement of double layer charging and SEM indicated that the interfacial area could be greatly increased by replication method. Larger interfacial area induced a better bending performance of **ionic polymer metal composite** (IPMC) (the magnitude of IPMC increased about 50% at 3 V). The surface resistance of IPMC and the effects of **cations** on IPMC were investigated with constant current experiment, cyclic voltammetry and electrochem. impedance spectroscopy (EIS).
ST **ionic polymer metal composite**
actuator impedance **ionic** cond
IT Interface
(area; electrochem. characterization of polymer actuator with large interfacial area)
IT Electric capacitance
(double-layer; electrochem. characterization of polymer actuator with large interfacial area)
IT **Cations**
Electric potential

- (effect on deformation of **ionic polymer metal composite** actuator with large interfacial area)
- IT **Composites**
Surface resistance
(electrochem. characterization of **ionic polymer metal composite** actuator with large interfacial area)
- IT Actuators
Electrode-electrolyte interface
(electrochem. characterization of polymer actuator with large interfacial area)
- IT Polymers, uses
RL: NUU (Other use, unclassified); USES (Uses)
(electrochem. characterization of polymer actuator with large interfacial area)
- IT Polyoxyalkylenes, uses
RL: NUU (Other use, unclassified); USES (Uses)
(fluorine- and sulfo-containing, ionomers; electrochem. characterization of **ionic polymer metal composite** actuator with large interfacial area)
- IT Surface structure
(of Nafion membrane in **ionic polymer metal composite** actuator with large interfacial area)
- IT Cyclic voltammetry
Electric impedance
(of **ionic polymer metal composite** actuator with large interfacial area)
- IT Fluoropolymers, uses
RL: NUU (Other use, unclassified); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; electrochem. characterization of **ionic polymer metal composite** actuator with large interfacial area)
- IT Ionomers
RL: NUU (Other use, unclassified); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; electrochem. characterization of **ionic polymer metal composite** actuator with large interfacial area)
- IT 7429-90-5, **Aluminum**, uses
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(foil, electrochem. etched; use in preparation of **ionic polymer metal composite** actuator with large interfacial area)
- IT 16940-66-2, Sodium tetrahydroborate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(use in preparation of **Pt** electrode for **ionic polymer metal composite** actuator with large interfacial area)
- IT 13933-32-9, **Platinum** tetraammine dichloride
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(use in preparation of electrode for **ionic polymer metal composite** actuator with large interfacial area)
- IT 7440-06-4P, **Platinum**, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PREP (Preparation); PROC (Process); USES (Uses)
(use in preparation of **ionic polymer metal**

composite actuator with large interfacial area)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L51 ANSWER 13 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2002:607227 HCAPLUS

DN 137:311650

ED Entered STN: 14 Aug 2002

TI Plasma formation of polymer-metal composites

AU Palacios, J. C.; Olayo, M. G.; Cruz, G. J.; Morales, J.; Olayo, R.

CS Posgrado en Materiales, Facultad de Quimica, UAEM, Mexico, Mex.

SO International Journal of Polymeric Materials (2002), 51(6), 529-536

CODEN: IJPMCS; ISSN: 0091-4037

PB Taylor & Francis Ltd.

DT Journal

LA English

CC 37-6 (Plastics Manufacture and Processing)

Section cross-reference(s): 76

AB Looking for improving the elec. conductivity of **polymers**, films consisting of polyaniline with particles and layers of **silver** and **copper** have been prepared by glow discharge plasma. The material obtained in this way had **metallic** particles dispersed within the **polymer** structure and thin **metallic** layers on the surface. The **ionic** and electronic rain in the plasma produces good inter-particle contacts between the **metal** and the **polymer** that increases the elec. conductivity of the material. The **polymer-metal composites** were characterized by transmission electronic microscopy, energy-dispersive X-ray microanal., X-ray diffraction and thermal gravimetric anal. The elec. conductivity was measured between 20-60 C.

ST polyaniline **silver copper** composite plasma polymn elec cond

IT Activation energy

Crystallinity

Electric conductivity

Polymer morphology

Thickness

(plasma formation and properties of polyaniline/**copper** and polyaniline/**silver** composites)

IT Polyanilines
RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(plasma formation of polyaniline/**copper** and polyaniline/**silver** composites)

IT Polymerization
(plasma; plasma formation of polyaniline/**copper** and polyaniline/**silver** composites)

IT 7440-22-4, **Silver**, uses 7440-50-8, **Copper**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(plasma formation of polyaniline/**copper** and polyaniline/**silver** composites)

IT 25233-30-1P, Polyaniline
RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(plasma formation of polyaniline/**copper** and polyaniline/**silver** composites)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L51 ANSWER 14 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:803404 HCAPLUS
DN 139:22748
ED Entered STN: 23 Oct 2002
TI Electrically controllable deformation memory effects in ionic polymers
AU Shahinpoor, Mohsen; Kim, Kwang J.
CS Artificial Muscle Res. Inst., Sch. of Eng. and Sch. of Med., The Univ. of New Mexico and Environmental Robots, Inc., Albuquerque, NM, 87131, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (2002), 4695(Electroactive Polymer Actuators and Devices (EAPAD)), 85-94
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 76
AB This paper reports a novel elec. deformation memory effect in connection with **ionic polymer conductor composites** (IPCC) and, in particular, **ionic polymer metal composites** (IPMC). This deformation memory effect is neither thermal, as observed in shape memory alloys, nor magnetic, as observed in magnetic shape memory alloys. An IPCC is capable of storing geometric shape and deformation information for a given step voltage or imposed elec. field, even when the field is turned off. This elec. deformation memory effect is more profound than the existing thermal or magnetic shape

memory effects that basically have only one configuration per a given threshold magnetic field or temperature. In other words, IPMC's do not need to be trained for a given shape memory effect such as SMA's or **ferromagnetic** shape memory materials but rather, they have an infinite set of possibilities of deformation shapes vs. voltage that can be memorized even when the elec. field is removed. This creates for the 1st time potential for given voltage signal or elec. field. The data presented here will establish that from a neutral position and charge free state, for any given voltage, a cantilever sample of IPMC bends to a shape, and if one removes the voltage, the shape will not change and the material remembers the shape permanently. The process is highly reversible. Any change in shape is due to environmental changes such as humidity or temperature, and in a controlled environment, we observe that after the voltage is removed, having allowed the sample to stabilize, the shape stays almost permanently. Upon shorting out the electrodes on the 2 sides of the sample, the sample moves back to its initial configuration before the application of the step voltage.

ST elec controllable deformation memory effect **ionic**

polymer metal composite

IT **Composites**

Polyelectrolytes

(elec. controllable deformation memory effects in **ionic**

polymer metal composites)

IT Memory effect

(elec.; elec. controllable deformation memory effects in **ionic**

polymer metal composites)

IT 7440-05-3, Palladium, properties 7440-06-4, **Platinum**,
properties 26654-97-7

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP
(Physical process); PROC (Process)

(elec. controllable deformation memory effects in **ionic**

polymer metal composites)

RE.CNT 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L51 ANSWER 15 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2002:803398 HCAPLUS

DN 138:256078

ED Entered STN: 23 Oct 2002

TI Progress of experimental characterization and micromechanistic modeling of actuation of **ionic polymer-metal composites**

AU Nemat-Nasser, Siavouche

CS Cent. of Excellence for Adv. Mater., Univ. of California/San Diego, La Jolla, CA, 92093-0416, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (2002), 4695(Electroactive Polymer Actuators and Devices (EAPAD)), 32-41 CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal; General Review

LA English

CC 38-0 (Plastics Fabrication and Uses)

Section cross-reference(s): 63, 72

AB A review. **Ionic polymer-metal**

composites (IPMCs) consist of a polyelectrolyte membrane (usually, Nafion or Flemion) plated on both faces by a **noble metal**, and is neutralized with certain counterions that balance the elec. charge of the anions covalently fixed to the backbone membrane. In the hydrated state, a cantilevered strip of this **composite** performs bending vibration when subjected to an AC potential across its faces, and it produces millivolt potential when suddenly bent. Thus the

composite is a soft actuator and sensor. Its coupled elec.-chemical-mech. response depends on the chemical composition and structure of the backbone **ionic polymer**; the morphol. of the **metal** electrodes; the nature of the **cations**; and the level of hydration. A systematic exptl. evaluation of the mech. response of both **metal**-plated and bare Nafion in various **cation** forms and various water saturation levels has been performed at UCSD. By examining the measured stiffness of the Nafion-based **composites** and the corresponding bare Nafion, under a variety of conditions, I have develop relations between internal forces and the resulting stiffness and deformation of this class of IPMCs. Based on these and through a comparative study of the effects of various **cations** on the material's stiffness and response, I have sought to identify potential micro-mechanisms responsible for the observed electro-mech. behavior of these materials, model them, and compare the model results with exptl. data. A summary of some of these developments is given in the present work.

ST review actuation **ionic polymer metal composite**

IT Electromechanical effect
(deformation; progress of exptl. characterization and micromechanistic modeling of actuation of **ionic polymer-metal composites**)

IT Deformation (mechanical)
(electromech.; progress of exptl. characterization and micromechanistic modeling of actuation of **ionic polymer-metal composites**)

IT Actuators
Cations
Polymer electrolytes
Sensors

(progress of exptl. characterization and micromechanistic modeling of actuation of **ionic polymer-metal composites**)

IT Ionomers
RL: TEM (Technical or engineered material use); USES (Uses)
(progress of exptl. characterization and micromechanistic modeling of actuation of **ionic polymer-metal composites**)

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L51 ANSWER 16 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2001:923686 HCAPLUS

DN 136:56000

ED Entered STN: 21 Dec 2001

TI Composite combining monolayer or multilayer of zeolite molecular sieve or its analogue onto a substrate and preparation thereof

IN Yoon, Kyung Byung; Ha, Kwang; Lee, Yunjo; Park, Yongsu; Chun, Yusung; Lee, Goosoo; Choi, Soyeun; Oh, Kyoungsun

PA S. Korea

SO PCT Int. Appl., 69 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM B32B027-00

CC 49-4 (Industrial Inorganic Chemicals)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001096106	A1	20011220	WO 2000-KR1002	20000902
	W: CN, JP, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				

PRAI KR 2000-19667 A 20000414

OS MARPAT 136:56000

AB The present invention relates to a zeolite-substrate **composite** having a zeolite monolayer or multilayer bound on the surface of the substrate, comprising (i) a substrate selected from a group consisting of a substrate having surface hydroxyl groups, a **metal** substrate capable of reacting with thiol groups, and a **polymeric** materials having reactive functional groups at its main or side chain, (ii) mol. sieve particles selected from porous oxides or sulfides having surface hydroxyl groups, and (iii) a linker derived from a linking compound having at least 2 functional groups at both terminal ends, of which one is chemical bonded to said substrate and the other is chemical bonded to said zeolite; wherein said chemical bonding of linker to the substrate and zeolite or its analog is achieved by any of covalent bonds, **ionic** bonds, and/or coordination bonds, and a method of preparing the same.

ST composite zeolite mol sieve multilayer substrate; monolayer zeolite mol sieve substrate composite

IT Nanotubes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(carbon; composite combining substrate with monolayer or multilayer of zeolite mol. sieve or analog using linker of)

IT Zeolites (synthetic), processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(composite combining monolayer or multilayer of zeolite mol. sieve or analog onto substrate and preparation thereof)

IT Semiconductor materials

(composite combining monolayer or multilayer of zeolite mol. sieve or analog onto substrate of)

IT Glass, processes

Metals, processes

Mica-group minerals, processes

Polymers, processes

- RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(composite combining monolayer or multilayer of zeolite mol. sieve or analog onto substrate of)
- IT Aluminophosphate zeolites
Oxides (inorganic), processes
Silicalites (zeolites)
Silicoaluminophosphate zeolites
Sulfides, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(composite combining substrate with monolayer or multilayer of mol. sieve of)
- IT Dialdehydes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(composite combining substrate with monolayer or multilayer of zeolite mol. sieve or analog using linker of)
- IT Amines, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(dendrimers; composite combining substrate with monolayer or multilayer of zeolite mol. sieve or analog using linker of)
- IT Amines, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(diamines; composite combining substrate with monolayer or multilayer of zeolite mol. sieve or analog using linker of)
- IT Carboxylic acids, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(dicarboxylic; composite combining substrate with monolayer or multilayer of zeolite mol. sieve or analog using linker of)
- IT Resins
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(peptide; composite combining monolayer or multilayer of zeolite mol. sieve or analog onto substrate of)
- IT 1303-00-0, Gallium arsenide (GaAs), processes 1315-09-9, Zinc selenide (ZnSe) 1332-29-2, Tin oxide 1344-28-1, Alumina, processes 7429-90-5, **Aluminum**, processes 7440-06-4, **Platinum**, processes 7440-21-3, Silicon, processes 7440-31-5, Tin, processes 7440-32-6, Titanium, processes 7440-50-8, **Copper**, processes 7440-57-5, **Gold**, processes 7440-74-6, Indium, processes 7631-86-9, Silicon dioxide, processes 9002-86-2, PVC 9004-34-6, Cellulose, processes 9005-25-8, Starch, processes 9005-53-2, Lignin, processes 9005-82-7, Amylose 9037-22-3, Amylopectin 13463-67-7, Titanium dioxide, processes 22398-80-7, Indium phosphide (InP), processes 50926-11-9, Indium tin oxide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(composite combining monolayer or multilayer of zeolite mol. sieve or analog onto substrate of)
- IT 12034-59-2, Niobium dioxide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(composite combining substrate with monolayer or multilayer of mol. sieve of)
- IT 99685-96-8, Fullerene (C60) 115383-22-7, Fullerene C70

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(composite combining substrate with monolayer or multilayer of zeolite mol. sieve or analog using linker of)

IT 1122-58-3, 4-Dimethylaminopyridine 24764-90-7 71310-21-9,
11-Mercaptoundecanoic acid
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(preparation of zeolite monolayer on **gold** plate based on amide bond using)

IT 60-23-1, 2-Aminoethanethiol 4420-74-0, 3-Mercaptopropyltrimethoxysilane 17481-19-5, 3-Chloro-1-propanethiol
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(preparation of zeolite monolayer on **gold** plate using)

IT 78-10-4, Tetraethoxysilane 553-26-4, 4,4'-Bipyridine 623-27-8, 1,4-Benzenedicarboxaldehyde 919-30-2, 3-Aminopropyltriethoxysilane 2530-83-8, [3-(2,3-Epoxypropoxy)propyl]trimethoxysilane 2530-87-2, (3-Chloropropyl)trimethoxysilane 9002-98-6 14167-18-1, Co(salen) 24801-88-5, 3-(Triethoxysilyl)propyl isocyanate 381174-01-2 381174-03-4
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(preparation of zeolite monolayer using)

IT 71808-68-9
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(used to modify substrate to prepare zeolite monolayer based on Diels-Alder reaction)

IT 144-55-8, Sodium bicarbonate, processes 1071-27-8, 3-Cyanopropyltrichlorosilane
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(used to modify substrate to prepare zeolite monolayer based on ionic bond)

IT 52217-57-9
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(used to modify zeolite particles to prepare zeolite monolayer based on Diels-Alder reaction)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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(2) Falconer; US 6043177 A 2000 HCAPLUS
(3) Korean Research Institute Of Chemical Technology; KR 99703 A 1999
(4) Ying; US 6028025 A 2000 HCAPLUS

L51 ANSWER 17 OF 50 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2001-290206 [30] WPIX
DNN N2001-207328 DNC C2001-088819
TI Medical device for contacting patient's bodily fluids comprises polymer substrate having biocompatible metal coating.
DC A96 D22 M13 P34
IN OGLE, M F; REIMINK, M S; SCHROEDER, R F
PA (SJUD-N) ST JUDE MEDICAL INC
CYC 24
PI WO 2001012246 A1 20010222 (200130)* EN 31p A61L027-30
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: BR CA CN JP

US 6322588 B1 20011127 (200175) A61F002-02
EP 1207916 A1 20020529 (200243) EN A61L027-30
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
ADT WO 2001012246 A1 WO 2000-US40649 20000815; US 6322588 B1 US 1999-375326
19990817; EP 1207916 A1 EP 2000-967397 20000815, WO 2000-US40649 20000815
FDT EP 1207916 A1 Based on WO 2001012246
PRAI US 1999-375326 19990817
IC ICM A61F002-02; A61L027-30
ICS A61L027-42; A61L029-00; A61L029-10; A61L029-12; A61L031-08;
A61L031-12
AB WO 200112246 A UPAB: 20010603
NOVELTY - A medical device comprises a polymer substrate (102) having a
biocompatible metal coating (104) over at least a portion of its surface.
The coating has an average thickness greater than 3 microns .
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a
method of producing a medical device comprising applying the metal coating
on the substrate.
USE - Prostheses that contact a patient's body fluids.
ADVANTAGE - The **metal/polymer composite**
has improved mechanical properties, e.g. mechanical strength, durability,
and resiliency contributed by the metal coating.
DESCRIPTION OF DRAWING(S) - The drawing shows a fragmentary
perspective view of a medical device, i.e. a mechanical heart valve
orifice.
Substrate 102
Coating 104
Dwg.1/3
FS CPI GMPI
FA AB; GI
MC CPI: A11-C04B1; A12-V02; A12-V03; A12-V03B; D09-C01; D09-C01B; D09-C01C;
M13-H; M13-H05

L51 ANSWER 18 OF 50 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2002-178853 [23] WPIX
CR 1999-203963 [17]; 2000-557520 [51]; 2000-627920 [60]; 2002-054362 [07];
2002-138236 [18]; 2002-163055 [21]; 2002-279757 [32]; 2002-291189 [33];
2004-096661 [10]; 2004-096662 [10]; 2004-096663 [10]
DNN N2002-136008 DNC C2002-055354
TI Manufacture of plastic lead frame structure for semiconductor devices,
involves forming plastic lead frame structure from polymeric material, and
coating frame structure with conductive material.
DC A85 L03 U11
IN JIANG, T; KING, J L
PA (JIAN-I) JIANG T; (KING-I) KING J L; (MICR-N) MICRON TECHNOLOGY INC
CYC 1
PI US 2001051397 A1 20011213 (200223)* 9p H01L021-44
US 6544820 B2 20030408 (200327) H01L021-44
ADT US 2001051397 A1 Cont of US 1997-878935 19970619, Cont of US 1998-195765
19981118, Cont of US 2000-639359 20000814, US 2001-921535 20010803; US
6544820 B2 Cont of US 1997-878935 19970619, Cont of US 1998-195765
19981118, Cont of US 2000-639359 20000814, US 2001-921535 20010803
FDT US 2001051397 A1 Cont of US 5879965, Cont of US 6124151, Cont of US
6294410; US 6544820 B2 Cont of US 5879965, Cont of US 6124151, Cont of US
6294410
PRAI US 1997-878935 19970619; US 1998-195765 19981118; US 2000-639359
20000814; US 2001-921535 20010803
IC ICM H01L021-44
ICS H01L021-48; H01L021-50
AB US2001051397 A UPAB: 20040210

NOVELTY - The method involves forming a plastic lead frame (10) structure from polymeric material, and coating the frame structure with a conductive material.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(i) manufacture of one or more portions of a semiconductor device. The method involves forming one or more conductive plastic lead frame having several lead fingers (12), by stamping and/or etching a conductive lead frame. A semiconductor device having several bond pads (14), is attached to a portion of one or more conductive plastic lead frame. One or more bond pads are connected to at least one lead finger. One or more portions of the semiconductor device and conductive plastic lead frame, are encapsulated; and

(ii) manufacture of circuit card. The method involves attaching one or more integrated circuit (IC) packages to a circuit card. One or more IC packages contain at least one conductive plastic lead frame formed by stamping and/or etching.

USE - The lead frame is used for packaging integrated circuits, and for manufacture of semiconductor devices and integrated circuits.

ADVANTAGE - Manufacturing cost of the plastic lead frame is reduced when compared with the manufacture of metal lead frame. Transparency, corrosion resistance and oxidation resistance of the plastic or composite plastic lead frame, are enhanced. The lead frame maintains its characteristics necessary for use in commercial production of IC packages. The overall cost of IC chip packaging is reduced by using plastic lead frames coated with conductive layers. The use of transparent polymers and intrinsically conductive polymers facilitates ultraviolet (UV) or other light source cure of die attach materials. The methods used to produce such lead frames are simple and can be easily incorporated into existing high-speed production lines for manufacturing IC chips.

DESCRIPTION OF DRAWING(S) - The figure shows the perspective view of the lead frame.

Plastic lead frame 10

Lead fingers 12

Bond pads 14

Dwg.3/7

FS CPI EPI

FA AB; GI

MC CPI: A11-C04B; A12-E07C; L04-C23

EPI: U11-D03A1A

L51 ANSWER 19 OF 50 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN

AN 2001-334643 [35] WPIX

DNN N2001-241471 DNC C2001-103315

TI Printed circuit board for use as dual in-line memory module for multiple memory components, comprises flexible portion having **metal** and **polymer composite** material.

DC A85 L03 U11 U14 V04

IN MACQUARRIE, S W; STUTZMAN, R J; ZALESINSKI, J M

PA (IBMC) INT BUSINESS MACHINES CORP

CYC 1

PI US 6212076 B1 20010403 (200135)* 13p H05K007-20

ADT US 6212076 B1 US 1999-259809 19990226

PRAI US 1999-259809 19990226

IC ICM H05K007-20

AB US 6212076 B UPAB: 20010625

NOVELTY - A printed circuit board comprises a first thermally conductive layer having a flexible portion between two dielectric layers. The flexible portion comprises **metal** and **polymer**

composite material.

DETAILED DESCRIPTION - A printed circuit board comprises a substrate having dielectric layers laminated together. A conductor with an electronic component (15A) is mounted on the surface of the dielectric layer. A first thermally conductive layer (8A) having flexible portion is provided between the two dielectric layers. The flexible portion has **metal and polymer composite material.** A thermal conductive aperture is positioned within the substrate and connected to the conductor. It thermally couples the electronic component to the first conductive layer. A second thermally conductive layer (8B) is placed on a portion of the surface of dielectric layer, spaced from the electronic component. Thermally conductive apertures (6A) are positioned within the substrate and thermally couple the second conductive layer to the first, thus electronic component is coupled to the second conductive layer.

USE - For use as dual in-line memory module used for multiple memory components.

ADVANTAGE - The invention enhances heat dissipation from electronic components, such as memory integrated circuit. They are easier to handle and can be used where limited space is required since they can be inserted in virtually any shape or space in system and occupy less space in the system.

DESCRIPTION OF DRAWING(S) - The figure shows a cutaway side view of a printed circuit board.

Apertures 6A

First and second conductive layers 8A, B

Electronic component 15A

Heat sink 18A

Dwg. 3/8

FS CPI EPI

FA AB; GI

MC CPI: A12-E04; A12-E07A; L03-H04E1

EPI: U11-D01A6; U14-A10; U14-H03B1; V04-Q05

L51 ANSWER 20 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2002:112023 HCAPLUS

DN 137:101920

ED Entered STN: 11 Feb 2002

TI A MEMS-based flexible sensor and actuator system for space inflatable structures

AU Tung, Steve; Witherspoon, Scott R.; Roe, Larry A.; Silano, Al; Maynard, David P.; Ferraro, Ned

CS Department of Mechanical Engineering, University of Arkansas, Fayetteville, AR, USA

SO Smart Materials and Structures (2001), 10(6), 1230-1239

CODEN: SMSTER; ISSN: 0964-1726

PB Institute of Physics Publishing

DT Journal

LA English

CC 76-3 (Electric Phenomena)

Section cross-reference(s): 38, 56

AB A MEMS [microelectromech. system]-based monitoring and control system (HMCS) for space inflatables was developed. Fabricated mostly from polymeric materials, the HMCS is lightwt., flexible and can be attached directly to the external surface of an inflatable membrane or other structures of spacecraft. The structures are fabricated of flexible polymers and require internal pressurization and are also vulnerable to the harsh space environment and catastrophic failure from structural vibration. Structure-wise, the HMCS is a three-dimensional multi-chip

module with a sensor layer at the top, a common polyimide substrate in the middle and an actuator layer at the bottom. The sensor layer consists of an interconnected network of MEMS sensors for monitoring the environmental conditions around the inflatable and also the structural vibration of the inflatable. The actuator layer, fabricated from electroactive polymers, provides a two-dimensional shape control capability to the HMCS. When operated with strain and vibration sensors in the sensor layer, the polymer actuator can deform the surface contour of the inflatable to remove wrinkles and dampen structural vibration.

- ST flexible sensor actuator inflatable membrane structure spacecraft;
polyimide **copper** layer substrate sensor actuator; nafion
ionic polymer metal composite
actuator titanium **gold** electrode
- IT Conducting polymers
Membranes, nonbiological
Piezoelectric actuators
Piezoelectric sensors
Space vehicles
Vibration
(flexible sensor and actuator system based on MEMS for control of
membranes and inflatable structures for spacecraft)
- IT Ionomers
RL: DEV (Device component use); USES (Uses)
(fluoropolymers; flexible sensor and actuator system based on MEMS for
control of membranes and inflatable structures for spacecraft)
- IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(ionomers; flexible sensor and actuator system based on MEMS for
control of membranes and inflatable structures for spacecraft)
- IT Micromachines
(microelectromech. systems; flexible sensor and actuator system based
on MEMS for control of membranes and inflatable structures for
spacecraft)
- IT Polyimides, uses
RL: DEV (Device component use); USES (Uses)
(polyether-; flexible sensor and actuator system based on MEMS for
control of membranes and inflatable structures for spacecraft)
- IT Polyethers, uses
RL: DEV (Device component use); USES (Uses)
(polyimide-; flexible sensor and actuator system based on MEMS for
control of membranes and inflatable structures for spacecraft)
- IT 7440-32-6, Titanium, uses 7440-50-8, **Copper**, uses 7440-57-5,
Gold, uses 25036-53-7, Kapton 25038-81-7, 4,4'-Diaminodiphenyl
ether-pyromellitic dianhydride copolymer 66796-30-3, Nafion 117
RL: DEV (Device component use); USES (Uses)
(flexible sensor and actuator system based on MEMS for control of
membranes and inflatable structures for spacecraft)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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Systems, ch 2 1999

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L51 ANSWER 21 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2001:792731 HCAPLUS

DN 136:217873

ED Entered STN: 01 Nov 2001

TI Ultrathin film actuators fabricated by layer-by-layer molecular self-assembly

AU Zeng, T.; Claus, R.; Zhang, F.; Du, W.; Cooper, K. L.

CS Fiber and Electro-Optics Res. Cent., Virginia Tech 0356, Blacksburg, VA, 24061, USA

SO Smart Materials and Structures (2001), 10(4), 780-785

CODEN: SMSTER; ISSN: 0964-1726

PB Institute of Physics Publishing

DT Journal

LA English

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 76

AB **Polymer/metal** cluster nanocomposite thin films as new types of electroactive **polymer** (EAP) material have been synthesized by the layer-by-layer (LBL) electrostatic self-assembly process. A self-assembled 11-bilayer poly-S-119/**Pt** nanocluster film, with a thickness of approx. 30 nm and a **Pt** content of 0.49 atomic%, exhibited an actuation response similar to that of conventional **ionic polymer-metal composite** films for low applied voltage in air, but nonlinear bending behavior in response to a slightly higher applied voltage. The film has a uniform nanostructure with the **Pt** nanoclusters dispersed within the multiple mol. layers, as confirmed by atomic force microscopy. The self-assembled electroactive films may have different actuation mechanisms from those of traditional piezoelec. materials, and from other EAP materials, due to the quite different LBL laminated structure. Further studies concerning the principles governing the novel processing of the films and applications are underway.

ST ultrathin film actuator polymeric self assembly; polymer metal cluster nanocluster film

IT Polyelectrolytes

(anionic; ultrathin film actuators fabricated by layer-by-layer mol. self-assembly)

IT Polyelectrolytes

(**cationic**; ultrathin film actuators fabricated by layer-by-layer mol. self-assembly)

IT Clusters
(nano-; ultrathin film actuators fabricated by layer-by-layer mol. self-assembly)

IT Actuators
Nanocomposites
Nanostructures
Quantum dot devices
Self-assembly
Ultrathin films
(ultrathin film actuators fabricated by layer-by-layer mol. self-assembly)

IT 7440-06-4, **Platinum**, uses 26062-79-3,
Poly(diallyldimethylammonium chloride) 119632-00-7, Poly-S 119
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(ultrathin film actuators fabricated by layer-by-layer mol. self-assembly)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L51 ANSWER 22 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2001:853742 HCAPLUS

DN 136:190712

ED Entered STN: 26 Nov 2001

TI Development of large-surface Nafion-metal composite actuator and its electrochemical characterization

AU Noh, Taegeun; Tak, Yong Suk; Nam, Jae-Do; Jeon, Jae Wook; Kim, Hoon Mo; Choi, Hyoukryeol; Bae, Sang Sik

CS Inha Univ., Incheon, 402-751, S. Korea

SO Proceedings of SPIE-The International Society for Optical Engineering (2001), 4329(Electroactive Polymer Actuators and Devices), 458-465

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal
LA English
CC 72-2 (Electrochemistry)
Section cross-reference(s): 38, 56
AB Behaviors of Nafion-based actuators are significantly affected by interfacial area between electrode and **polymer** electrolyte. Replication method was utilized to manufacture a large surface-area **composite** actuator. Etched **aluminum** foil was used as a template for replication using liquid nafion solution. Measurement of double layer charging and SEM indicated that interfacial area was greatly increased by replication method. Higher surface area induced a better bending performance of **ionic polymer metal composite** (IPMC). In parallel, the effect of **cations** on IPMC was interpreted with constant current experiment, linear sweep voltammetry and electrochem. impedance spectroscopy. For univalent **cations**, ion size is the most influencing parameter on **ionic** mobility inside membrane. However, ion-ion interaction affects an **ionic** mobility for divalent **cations**.
ST large surface Nafion **platinum** composite actuator deformation **cation** effect
IT Actuators
Composites
Conducting polymers
(development of large-surface Nafion-metal composite actuator and its electrochem. characterization)
IT Electric potential
(effect on deformation of Nafion-metal composite actuator)
IT **Cations**
(effect on deformation of Nafion-metal composite actuator in electrolyte)
IT Etching
(electrochem.; of **aluminum** before Nafion coating in process of preparation of Nafion-metal composite actuator)
IT Coating process
(electroless; of **platinum** in process of preparation of large-surface Nafion-metal composite actuator)
IT Polyoxyalkylenes, uses
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(fluorine- and sulfo-containing, ionomers; development of large-surface Nafion-metal composite actuator and its electrochem. characterization)
IT Cyclic voltammetry
(of large-surface Nafion-metal composite in solution containing different **cations**)
IT Surface structure
(of nafion membrane formed by replicaton technique and Nafion-metal composite)
IT Fluoropolymers, uses
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; development of large-surface Nafion-metal composite actuator and its electrochem. characterization)
IT Ionomers
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; development of large-surface Nafion-metal composite actuator and its electrochem. characterization)
IT Deformation (mechanical)
(potential effect on deformation of Nafion-metal composite actuator in electrolyte with different **cations**)
IT 7440-06-4P, **Platinum**, uses

RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); PROC (Process); USES (Uses)

(development of large-surface Nafion-metal composite actuator and its electrochem. characterization)

- IT 12408-02-5, Hydrogen 1+, reactions 14127-61-8, Ca 2+, reactions 17341-24-1, Li 1+, reactions 17341-25-2, Sodium 1+, reactions 22537-22-0, Mg 2+, reactions 24203-36-9, Potassium 1+, reactions
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(effect on deformation of Nafion-metal composite actuator)
- IT 50-00-0, Formaldehyde, reactions 16941-12-1, Hexachloroplatinic acid
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electroless deposition of **platinum** in process of preparation of large-surface Nafion-metal composite actuator, from solution containing)
- IT 7429-90-5, **Aluminum**, uses
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(etched; fabrication of large-surface Nafion-metal composite actuator by **Pt** electroless deposition on Nafion plate on)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L51 ANSWER 23 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2001:853718 HCAPLUS

DN 136:402480

ED Entered STN: 26 Nov 2001

TI Novel physically loaded and interlocked electrode developed for **ionic polymer-metal composites** (IPMCs) 2

AU Shahinpoor, Mohsen; Kim, Kwang J.

CS Environmental Robots, Inc, Albuquerque, NM, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (2001), 4329(Electroactive Polymer Actuators and Devices), 174-181

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 37-6 (Plastics Manufacture and Processing)

AB Described is a novel fabrication process of manufacturing **ionic polymeric metal composites** (IPMC's) biomimetic sensors, actuators and artificial muscles equipped with phys. loaded and interlocked (PLI) electrodes. The underlying principle of processing this novel PLI-IPMC's is to first phys. load a conductive primary powder into the **ionic polymer** network forming a dispersed particulate layer. This primary layer functions as a major conductive medium. Subsequently, this primary layer of dispersed particles of a conductive material is interlocked within the **polymer** network with smaller secondary particles via chemical plating, which used reducing agents to load another phase of conductive particles within the first layer. In turn, both primary and secondary particles can be secured within the **ionic polymer** network and reduce the potential intrinsic contact resistances between large primary particles. Furthermore, electroplating can be applied to integrate the entire primary and secondary conductive phases and serve as another effective interlocking electrode. In this paper we describe the details of this newly developed technique to efficiently produce a PLI-IPMC loaded with spherical **silver** particles (D10<0.8 μm , D50<1.5 μm , D90<2.5 μm ; Asur<6 m2/g) and subsequently interlocked by palladium (Dp.apprx.50nm, via a chemical reducing process). It has been observed that such a PLI-IPMC is quite comparable in performance with the traditional **Platinum** loaded and **Gold** electro-plated IPMC's but enjoys a much smaller manufacturing cost. Yet it produces a low surface resistivity (less than 1 Ω /square) which is highly desirable in creating more uniform deformation.

ST **ionic polymer metal composite**

IT **Cation exchange membranes**

Polymer morphology

(phys. loaded and interlocked electrode developed for **ionic polymer-metal composites**)

IT Fluoropolymers, uses

RL: DEV (Device component use); POF (Polymer in formulation); USES (Uses)

(phys. loaded and interlocked electrode developed for **ionic polymer-metal composites**)

IT 7440-05-3, Palladium, uses 7440-22-4, **Silver**, uses

RL: DEV (Device component use); USES (Uses)

(phys. loaded and interlocked electrode developed for **ionic polymer-metal composites**)

IT 66796-30-3, Nafion 117

RL: DEV (Device component use); POF (Polymer in formulation); USES (Uses)

(phys. loaded and interlocked electrode developed for **ionic polymer-metal composites**)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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(8) Shahinpoor, M; US 6109852 2000 HCAPLUS

(9) Shahinpoor, M; Smart Materials and Structures 1998, V7, P15

(10) Shahinpoor, M; Smart Materials and Structures 2000, V9, P543 HCAPLUS

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HCAPLUS

L51 ANSWER 24 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2000:749148 HCAPLUS

DN 133:304588

ED Entered STN: 24 Oct 2000

TI Multilayered ceramic electronic chips

IN Aiba, Takashi; Ochiai, Toshiaki; Maruno, Satoshi

PA TDK Electronics Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01G004-12

ICS C23C030-00

CC 76-10 (Electric Phenomena)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000299243	A2	20001024	JP 1999-108846	19990416
PRAI	JP 1999-108846		19990416		

AB In chips comprising of alternate laminates of ceramic sheets and internal electrodes, the main electrode layer is made of sintered metals mainly comprising of Cu or Ni and the outer electrode is covered with a noble metal coating which is resistant to oxidation. The outer electrodes are connected to lands of circuit patterns via **conductive polymer** pastes without oxidation.

ST multilayer ceramic electronic chip outer electrode; noble metal coating outer electrode chip; oxidn resistant outer electrode multilayered chip; sintered nickel electrode multilayer ceramic capacitor; copper sintered electrode multilayer ceramic capacitor

IT **Precious metals**

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(**coating**; multilayer ceramic electronic chips with

oxidation-resistant outer electrodes having noble metal coatings)

IT Ceramic capacitors

(multilayer, outer electrode; multilayer ceramic electronic chips with oxidation-resistant outer electrodes having noble metal coatings)

IT Electrodes

(outer; multilayer ceramic electronic chips with oxidation-resistant outer electrodes having noble metal coatings)

IT Coating materials

(oxidation-resistant; multilayer ceramic electronic chips with oxidation-resistant outer electrodes having noble metal coatings)

IT 7440-05-3, Palladium, properties 7440-06-4, Platinum, properties

7440-22-4, Silver, properties 7440-57-5, Gold, properties

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(**coating**; multilayer ceramic electronic chips with oxidation-resistant outer electrodes having noble metal coatings)

IT 7440-02-0, Nickel, uses 7440-50-8, Copper, uses

RL: DEV (Device component use); USES (Uses)

(inner electrode; multilayer ceramic electronic chips with

oxidation-resistant outer electrodes having noble metal coatings)

L51 ANSWER 25 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2000:342517 HCAPLUS

DN 132:337981

ED Entered STN: 23 May 2000

TI Amorphous **carbon**-metal bonded composites

IN Sakaguchi, Tomozo; Yamamura, Kiyohiko
 PA Unitika Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C04B037-02
 CC 56-9 (Nonferrous Metals and Alloys)
 Section cross-reference(s): 38, 55, 57

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000143362	A2	20000523	JP 1998-314773	19981105
PRAI	JP 1998-314773		19981105		

AB The composite consists of an amorphous **carbon** material and a metal material bonded with a heat-resistant elec. **conducting** adhesive. The adhesive comprises thermosetting resin containing dispersions of elec. **conducting** particles. The composites are suitable as silicon wafer holders, battery electrodes, etc.

ST amorphous **carbon** metal bonding polymer adhesive; heat resistant adhesive **carbon** metal composite; **conductor** adhesive **carbon** metal composite; thermoplastic resin adhesive **carbon** metal composite

IT Epoxy resins, uses
 Polyimides, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (adhesives; amorphous **carbon**-metal composites bonded with thermosetting resin adhesives containing elec. **conductor** dispersions)

IT Holders
 (composites for vacuum chucks in semiconductor device fabrication apparatus; amorphous **carbon**-metal composites bonded with thermosetting resin adhesives containing elec. **conductor** dispersions)

IT Adhesives
 (**conductive**; amorphous **carbon**-metal composites bonded with thermosetting resin adhesives containing elec. **conductor** dispersions)

IT Adhesives
 (heat-resistant, elec. **conductor**; amorphous **carbon**-metal composites bonded with thermosetting resin adhesives containing elec. **conductor** dispersions)

IT Pipes and Tubes
 (stainless steel, composites; amorphous **carbon**-metal composites bonded with thermosetting resin adhesives containing elec. **conductor** dispersions)

IT Electric **conductors**
 (thermosetting resin adhesives containing dispersions of; amorphous **carbon**-metal composites bonded with thermosetting resin adhesives containing elec. **conductor** dispersions)

IT **Palladium** alloy, base
 RL: TEM (Technical or engineered material use); USES (Uses)
 (composite; amorphous **carbon**-metal composites bonded with thermosetting resin adhesives containing elec. **conductor** dispersions)

IT 268548-36-3, XA 412FT 268548-38-5, XA 875
 RL: TEM (Technical or engineered material use); USES (Uses)
 (adhesive; amorphous **carbon**-metal composites bonded with thermosetting resin adhesives containing elec. **conductor** dispersions)

- IT 7440-44-0, **Carbon**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(amorphous; amorphous **carbon-metal** composites bonded with
thermosetting resin adhesives containing elec. **conductor**
dispersions)
- IT 7439-89-6, **Iron**, uses 7440-05-3, **Palladium**, uses
7440-50-8, **Copper**, uses 11106-97-1 11109-50-5, SUS 304
RL: TEM (Technical or engineered material use); USES (Uses)
(composite; amorphous **carbon-metal** composites bonded with
thermosetting resin adhesives containing elec. **conductor**
dispersions)
- IT 7440-22-4, **Silver**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(thermosetting **polymer** adhesive containing; amorphous
carbon-metal composites bonded with
thermosetting resin adhesives containing elec. **conductor**
dispersions)
- L51 ANSWER 26 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 2000:663166 HCAPLUS
DN 134:208802
ED Entered STN: 22 Sep 2000
TI The effect of surface-electrode resistance on the performance of
ionic polymer-metal composite (IPMC)
artificial muscles
AU Shahinpoor, Mohsen; Kim, Kwang J.
CS Environmental Robots, Albuquerque, NM, 87108, USA
SO Smart Materials and Structures (2000), 9(4), 543-551
CODEN: SMSTER; ISSN: 0964-1726
PB Institute of Physics Publishing
DT Journal
LA English
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 37, 76
AB The effects of the surface-electrode resistance on the performance of
ionic polymer-metal composite (IPMC)
artificial muscles were studied. The IPMC artificial muscles manufactured in
this study is composed of a perfluorinated ion-exchange membrane,
platinum composited by using a chemical processing
technique that employs a **platinum** salt and appropriate reducing
agents. The IPMC artificial muscles were optimized for producing improved
forces by changing multiple process parameters including the
time-dependent concns. of the salt and reducing agents. The
platinum electrode is successfully deposited on the surface of the
material where **platinum** particles stay in a dense form that
appears to introduce a significant level of surface-electrode resistance.
In order to address this problem, a thin layer of **silver** (or
copper) was electrochem. deposited on top of the **platinum**
electrode to reduce the surface-electrode resistance. Actuation tests
were performed for such IPMC artificial muscles under a low voltage. The
lower surface-electrode resistance generates higher actuation capability
in the IPMC artificial muscles. This observation is briefly discussed
based on the role that the equivalent circuit for the IPMC plays and a
possible electrophoretic **cation**-transport phenomenon under the
influence of an elec. field.
ST perfluorinated ion exchange membrane **platinum** composite
artificial muscle; surface electrode resistance polymer metal composite
artificial muscle
IT Ion exchange membranes

- Particle size
Particles
Surface resistance
(effect of surface-electrode resistance on performance of **ionic polymer-metal composite** artificial muscles)
- IT Fluoropolymers, uses
Ionomers
RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(effect of surface-electrode resistance on performance of **ionic polymer-metal composite** artificial muscles)
- IT 7440-06-4, **Platinum**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(effect of surface-electrode resistance on performance of **ionic polymer-metal composite** artificial muscles)
- IT 7439-93-2, **Lithium**, processes 7440-22-4, **Silver**, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(effect of surface-electrode resistance on performance of **ionic polymer-metal composite** artificial muscles)
- RE.CNT 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD
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 - (6) de Gennes, P; Europhys Lett 2000, V50, P513 HCAPLUS
 - (7) Doi, M; Macromolecules 1992, V25, P5504 HCAPLUS
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L51 ANSWER 27 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1999:340743 HCAPLUS

DN 131:105454

ED Entered STN: 03 Jun 1999

TI Innovative molding technologies for the fabrication of components for microsystems

AU Piotter, Volker; Benzler, Tobias; Hanemann, Thomas; Wollmer, Heinz; Ruprecht, Robert; Hausselt, Jurgen

CS Forschungszentrum Karlsruhe GmbH Institut fur Materialforschung III, Karlsruhe, D-76021, Germany

SO Proceedings of SPIE-The International Society for Optical Engineering (1999), 3680(Pt. 1, Design, Test and Microfabrication of MEMS and MOEMS), 456-463

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal; General Review

LA English

CC 57-0 (Ceramics)

Section cross-reference(s): 38, 55, 56

AB A review with 14 refs. Economic success of microsystems technol. requires a wide range of materials as well as the related manufacturing processes. A suitable technol. for medium/large scale production is micro-injection molding which actually allows the manufacturing of plastic microstructures with 20 μ min. thickness, structural details of approx. 0.2 μ or maximum aspect ratios of more than 20. These microstructures are, for example, applied as components in micro-optics, micro-fluidics or minimally invasive surgery. For higher economic efficiency and cost reduction, fully elec. injection molding machines of higher accuracy have been applied. Also, micro-insert injection molding reduces mounting costs. Manufacturing of metal or ceramic microparts by powder injection molding allows large-scale production of complex shaped microstructures with a wide range of materials. Typical examples are sintered structures like stepped LIGA-gear wheels with minimal dimensions of 50 μ in different metal and ceramic materials. Micro precision casting originating from conventional investment casting is a suitable process for small/medium-scale production. Examples are microturbine housings made of **precious metal** alloys. An approach similar to rapid prototyping applies photocurable reactive resins. Photoinduced molding of low viscous resins under ambient conditions leads to significantly reduced cycle times. Addnl., rapid testing of new composite materials can be performed easily. Microcomponents molded from polymers and different composites like dyes with nonlinear optical properties and nanosized ceramic powders are presented.

ST review molding technol microsystem component fabrication; polymer microsystem component fabrication molding technol review; metal

microsystem component fabrication molding technol review; ceramic
microsystem component fabrication molding technol review; injection
molding technol microsystem component fabrication review; precision
casting technol microsystem component fabrication review

IT Molding
(injection, micro-; innovative molding technol. for fabrication of
ceramic/metal/polymer components for microsystems)

IT Molding
(injection, powder; innovative molding technol. for fabrication of
ceramic/metal/polymer components for microsystems)

IT Ceramics
Composites
(innovative molding technol. for fabrication of ceramic/**metal**
/polymer components for microsystems)

IT Metals, preparation
Polymers, preparation
RL: DEV (Device component use); IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(innovative molding technol. for fabrication of ceramic/metal/polymer
components for microsystems)

IT Casting process
(precision, micro-; innovative molding technol. for fabrication of
ceramic/metal/polymer components for microsystems)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L51 ANSWER 28 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:451620 HCAPLUS
DN 132:112970
ED Entered STN: 23 Jul 1999
TI Effect of the surface-electrode resistance on the actuation of
ionic polymer-metal composite (IPMC)
artificial muscles
AU Kim, Kwang J.; Shahinpoor, Mohsen
CS School of Eng., Artical Muscles Res. Inst. (AMRI), Univ. of New Mexico,
Albuquerque, NM, USA
SO Proceedings of SPIE-The International Society for Optical Engineering
(1999), 3669(Electroactive Polymer Actuators and Devices), 308-319
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal

LA English
CC 63-7 (Pharmaceuticals)
AB In this work the effect of surface-electrode resistance on the actuation of **ionic polymer-metal composites** (IPMCs) artificial muscles is investigated. The as-received ion-exchange membrane (IEM) was **platinum-composited** by using a unique chemical processing technique that employs a **platinum-salt** and appropriate reducing agents. The IPMCs artificial muscles were optimized for producing maximum forces by changing multiple process parameters including time-dependent concns. of the salt and reducing agents. The anal. results confirmed that the **platinum** electrode is successfully deposited on the surface of the IEM where **platinum** particles stay in a dense form that appears to introduce a significant level of surface- electrode resistance. In order to address this problem, a thin layer of **silver** (or **copper**) was electrochem. deposited on top of the **platinum** electrode to reduce the surface-electrode resistance. Actuation tests were performed for such IPMC artificial muscles under a low voltage. Tests results show that the lower surface-electrode resistance generates the higher actuation capability in the IPMCs artificial muscles. This observation is briefly discussed based on an equivalent circuit theory regarding the IPMC and a possible electrophoretic **cation**-transport phenomenon under the influence of an elec. field.

ST ionomer metal composite artificial muscle; surface electrode resistance actuation artificial muscle

IT Prosthetic materials and Prosthetics
(**composites**; surface-electrode resistance effect on actuation of **ionic polymer-metal composite** artificial muscles)

IT **Ionic** conductors
(**polymeric**; surface-electrode resistance effect on actuation of **ionic polymer-metal composite** artificial muscles)

IT Actuators
Electric resistance
Electrodes
Ion exchangers
(surface-electrode resistance effect on actuation of **ionic polymer-metal composite** artificial muscles)

IT Fluoropolymers, biological studies
Ionomers
RL: DEV (Device component use); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(surface-electrode resistance effect on actuation of **ionic polymer-metal composite** artificial muscles)

IT 7440-06-4, **Platinum**, biological studies
RL: DEV (Device component use); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(surface-electrode resistance effect on actuation of **ionic polymer-metal composite** artificial muscles)

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L51 ANSWER 29 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1999:451598 HCAPLUS

DN 132:112965

ED Entered STN: 23 Jul 1999

TI Electromechanics of ionoelastic beams as electrically controllable

- artificial muscles
- AU Shahinpoor, Mohsen
- CS Artificial Muscle Res. Inst., Sch. Eng. and Sch. Med., Univ. of New Mexico, Albuquerque, NM, USA
- SO Proceedings of SPIE-The International Society for Optical Engineering (1999), 3669(Electroactive Polymer Actuators and Devices), 109-121
CODEN: PSISDG; ISSN: 0277-786X
- PB SPIE-The International Society for Optical Engineering
- DT Journal
- LA English
- CC 63-7 (Pharmaceuticals)
- Section cross-reference(s): 38
- AB Presented are theor. and exptl. results on elec. controlled static and dynamic flexing and deformation of iono-elastic beams made with **ionic-polymer metal composite** (IPMC) artificial muscles. These **composite** materials have the capability of large motion sensing and actuation in a biomimetic fashion. The essence of the underlying iono-elastic response of such materials is due to Coulombic electro-dynamic charge interaction amongst a dispersed phase of **metallic** particles that are charged either pos. or neg., mobile phase of a **cation** such as hydrogen ions H^{+} (Protons) or Li^{+} , Hydroxyl anions OH^{-} , and a fixed anionic phase such as an assembly of sulfonates SO_3^{-} elastically attached to the backbone **polymer** network macromols. The math. model presented is analogous to classical Euler-Bernoulli's beam theory modified to accommodate a non-homogeneous distributed elec.-induced moment due to the presence of a non-homogeneous elec. field in an elastic material. The presentation may be extended to materials governed by hyper- elasticity such as in rubber elasticity. Anal. solution obtained agree reasonably well with our exptl. results on **Cationic Polymer-Platinum Composites** (CPPC) which are also reported in this paper.
- ST electromechanics ionoelastic beam elec artificial muscle
- IT Muscle
(artificial; electromechanics of ionoelastic beams as elec. controllable artificial muscles)
- IT Electromechanical effect
(electroelastic; electromechanics of ionoelastic beams as elec. controllable artificial muscles)
- IT Elasticity
Ionophores
(electromechanics of ionoelastic beams as elec. controllable artificial muscles)
- IT Fluoropolymers, biological studies
RL: PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(electromechanics of ionoelastic beams as elec. controllable artificial muscles)
- IT Ionic conductors
(polymeric; electromechanics of ionoelastic beams as elec. controllable artificial muscles)
- IT 7440-06-4, **Platinum**, biological studies
RL: PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(electromechanics of ionoelastic beams as elec. controllable artificial muscles)
- RE.CNT 51 THERE ARE 51 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L51 ANSWER 30 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1999:340805 HCAPLUS

DN 131:95384

ED Entered STN: 03 Jun 1999

TI Thermal cycling induced wiping wear of connector contacts at 150 °C

AU Leung, Chi H.; Lee, Anthony

CS Delphi Automotive Systems, Delphi R & D, Warren, MI, 48090-9055, USA

SO IEEE Transactions on Components and Packaging Technologies (1999), 22(1), 72-78

CODEN: ITCFPB; ISSN: 1521-3331

PB Institute of Electrical and Electronics Engineers

DT Journal

LA English

CC 76-2 (Electric Phenomena)

AB Expts. were performed to study the contact resistance changes of several common connector contact materials (.2% Co hard gold plate, Diffuse Gold Alloy (DGR-156), tin plated copper alloy and silver plated copper alloy) at 150°. The emphasis was on contact degradation due to thermal expansion type of relative contact interface movement, i.e., low frequency (<0.01 Hz) and large wipe distance (>100 µm) fretting. The contact samples were the standard dimple-flat configuration. Elec. degradation as contact

resistance rise was measured. SEM and Energy Dispersive Spectroscopy were used to analyze the surface morphol. and composition changes. For the **precious metal coating** (Hard Au plate, DGR-156 and Ag plate), wear through of the plating layer is the cause of resistance increase. For the **nonnoble** plating such as tin, contact resistance increased with oxide accumulation. Suitable lubricants are effective for Sn plating to delay the resistance rise.

ST elec connector material wear contact resistance
IT Spectroscopy
(energy-dispersive; thermal cycling induced wiping wear of connector contacts at 150 °C)
IT Erosion (wear)
(fretting; thermal cycling induced wiping wear of connector contacts at 150 °C)
IT Coating materials
Contact resistance
Lubricants
Scanning electron microscopy
Surface structure
Wear
(thermal cycling induced wiping wear of connector contacts at 150 °C)
IT 7440-22-4, Silver, properties 7440-31-5, Tin, properties 7440-57-5, Gold, properties 84721-67-5, DGR156
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(thermal cycling induced wiping wear of connector contacts at 150 °C)
IT 16833-27-5, Oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(thermal cycling induced wiping wear of connector contacts at 150 °C)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L51 ANSWER 31 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1997:616952 HCAPLUS

DN 127:280781

ED Entered STN: 27 Sep 1997

TI Electroconductive polymer composites as cathode active materials in secondary batteries and secondary nonaqueous batteries using these composites

IN Chen, Show-an; Lin, Liang-chang

PA National Science Council, Taiwan

SO U.S., 17 pp.

CODEN: USXXAM

DT Patent

LA English

IC ICM H01M006-16

ICS H01M006-14; H01M004-58; H01M004-42

NCL 429192000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5667913	A	19970916	US 1995-410434	19950323
	US 5863454	A	19990126	US 1997-779082	19970106
	US 5849045	A	19981215	US 1997-825290	19970327
PRAI	US 1995-410434		19950323		

AB The **composites** includes 10-99 conjugated electroconductive **polymer**, such as polyaniline, and 1-90 weight% **polymeric** electrolyte composed of 10-90 **ionic** salt, such as LiClO₄, and 10-90 weight% **polymer** which can form an electrolyte material with the **ionic** salt. The ionizable **polymer** having a number average mol. weight of >1000 is selected from poly(vinyl alc.), polyalkylene oxide, and copolymers of the 2. The cathode including these **composites** is prepared by dissolving the above 3 components in an appropriate solvent (e.g., 1-methyl-2-pyrrolidinone), casting the resulting solution on an appropriate **metallic** grid or plate, and removing the solvent to form a film which adheres to the **metal** grid or plate, in which the film is a pos. electrode active material and the **metallic** grid or plate is a current collector.

ST electroconductive polymer composite battery cathode; polyaniline polyvinyl alc composite battery cathode; ionic salt polymer composite battery cathode

IT Battery cathodes
(electroconductive polymer composites as active materials of)

IT Polyoxyalkylenes, uses
Polyoxyalkylenes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(lithium complexes; in electroconductive polymer composites as cathode active materials)

IT 7439-93-2D, Lithium, poly(vinyl alc.) complexes, uses
RL: DEV (Device component use); USES (Uses)
(in electroconductive polymer composites as cathode active materials)

IT 9002-89-5D, Poly(vinyl alcohol), lithium complexes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(in electroconductive polymer composites as cathode active materials)

IT 25233-30-1P, Polyaniline
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(in electroconductive polymer composites as cathode active materials)

IT 25190-06-1D, Polybutylene oxide, lithium complexes 25322-68-3D, Polyethylene oxide, lithium complexes 25322-69-4D, Polypropylene oxide, lithium complexes
RL: TEM (Technical or engineered material use); USES (Uses)
(in electroconductive polymer composites as cathode active materials)

IT 872-50-4, 1-Methyl-2-pyrrolidinone, uses 7429-90-5, **Aluminum**, uses 7440-06-4, **Platinum**, uses 12597-68-1, Stainless steel, uses
RL: NUU (Other use, unclassified); USES (Uses)
(in manufacture of electroconductive polymer composites as cathode active materials)

L51 ANSWER 32 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1998:426861 HCAPLUS

DN 129:112021

ED Entered STN: 11 Jul 1998

TI Thermal cycling induced wiping wear of connector contacts at 150°C

AU Leung, Chi H.; Lee, Anthony

CS GM RandD Center, Warren, MI, USA

SO Electrical Contacts (1997), 43rd, 132-137

CODEN: ECHSDG; ISSN: 0361-4395

PB Institute of Electrical and Electronics Engineers

DT Journal

LA English

CC 56-10 (Nonferrous Metals and Alloys)

AB Expts. were performed to study the contact resistance changes of several common connector contact materials (.2% Co hard gold plate, Diffuse Gold Alloy (DGR-156), tin plated copper alloy and silver plated copper alloy) at 150°C. The emphasis was on contact degradation due to thermal expansion type of relative contact interface movement, i.e. low frequency (< 0.01Hz) and large wipe distance (>100µm) fretting. The contact specimens were the standard dimple-flat configuration. Elec. degradation in the form of contact resistance rise was measured. SEM and Energy Dispersive Spectroscopy were used to analyze the surface morphol. and composition changes. For the **precious metal coating** (Hard Au plate, DGR-156, and Ag plate), wear through of the plating layer was found to be the cause of resistance increase. For the **non-noble** plating such as tin, contact resistance increased with oxide accumulation. Suitable lubricants were demonstrated to be effective for Sn plating to delay the resistance rise.

ST tin plated copper elec contact wear; silver plated copper elec contact wear; gold plated copper elec contact wear

IT Contact resistance
Electrodeposits
Thermal fatigue
(thermal cycling induced wiping wear of electroplated Cu alloy connector contacts at 150°C)

IT 7440-22-4, Silver, properties 7440-31-5, Tin, properties 37192-31-7
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(electroplates; thermal cycling induced wiping wear of electroplated Cu alloy connector contacts at 150°C)

IT 12773-57-8, C63800 39366-88-6, C17500 39476-58-9, C17000
105606-11-9, UNS C65400
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(thermal cycling induced wiping wear of electroplated Cu alloy connector contacts at 150°C)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Anon; Friction, Lubrication, and Wear Technology, ASM Handbook 1992, V18, P3
- (2) Antler, M; Proc 29th Holm Conf on Electrical Contacts 1984, P3 HCAPLUS
- (3) Lee, A; Fretting Corrosion of Electrical Contacts at Elevated Temperatures 1988, E3-76
- (4) Waterhouse, R; Wear 1984, V100, P107

L51 ANSWER 33 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1997:488856 HCAPLUS

ED Entered STN: 04 Aug 1997

TI Solid polymer electrolyte membranes for olefin/paraffin separation.

AU Pinnau, I.; Toy, L. G.; Sunderrajan, S.; Freeman, B. D.

CS Membrane Technology and Research, Inc., Menlo Park, CA, 94025, USA

SO Book of Abstracts, 214th ACS National Meeting, Las Vegas, NV, September 7-11 (1997), PMSE-063 Publisher: American Chemical Society, Washington, D. C.

CODEN: 64RNAO

DT Conference; Meeting Abstract

LA English

AB **Polymer** electrolytes formed from ether-based **polymers** doped with **metal** ions are well known in battery cell applications. In solid **polymer** electrolytes, direct interactions of the **metal cation** of a dissolved salt and the electron donor pairs of a heteroatom such as oxygen in the matrix

polymer yield conductive solids. The basic feature of a **polymer** electrolyte is that **ionic** motions can take place without a solvent being present in the system. In this paper, we will report the sorption as well as the pure- and mixed gas permeation properties of thin-film **composite** membranes for olefin/paraffin separation based on rubbery polyether/**silver** salt **composite** membranes. Solid **polymer** electrolyte membranes can be operated in a completely dry environment and show high olefin fluxes and high olefin/paraffin selectivities.

L51 ANSWER 34 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1996:641203 HCAPLUS
 DN 125:278770
 ED Entered STN: 31 Oct 1996
 TI Electric conductive coating and solder structures and electric conductive products prepared from the structures
 IN Menya, Kazunori; Harada, Mitsuru; Oohayashi, Takashi; Sakurai, Wataru; Himori, Goji
 PA Matsushita Electric Ind Co Ltd, Japan
 SO Jpn. Kokai Tokkyo Koho, 9 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C08L061-06
 ICS C08L101-00; H01B005-14; H01B005-16; H05K001-09
 ICA H05K003-24
 CC 42-10 (Coatings, Inks, and Related Products)
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08199041	A2	19960806	JP 1995-69254	19950328
	JP 3431338	B2	20030728		
PRAI	JP 1995-69254	A	19950328		
	JP 1994-288289		19941122		
AB	The structures are prepared by immersing coatings from mixts. of resolic phenolic resins bearing with dimethylene ethers, compatible liner binders and Ni and/or rare metal alloy coated with precious metal in solders and cooling. Thus, applying a coating from a mixture of Ni coated with Pd 100, PL 4348 8, U Vanish (polyimide) 3 and benzyl alc. 10 parts onto a substrate and immersing into a solder gave an elec. conductive plate having good adhesion.				
ST	elec conductive phenolic nickel coating; solder coating phenolic resin; palladium nickel phenolic resin coating				
IT	Polyimides, uses RL: DEV (Device component use); POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses) (coating, U Varnish; elec. conductive coating and solder structures and elec. conductive products prepared from the structures)				
IT	Solders (elec. conductive coating and solder structures and elec. conductive products prepared from the structures)				
IT	Acrylic polymers , uses Alkyd resins Binding materials Polyamides, uses Polyesters, uses Rubber, neoprene Rubber, nitrile				

Urethane **polymers**Vinyl acetal **polymers**

RL: DEV (Device component use); POF (Polymer in formulation); TEM
(Technical or engineered material use); USES (Uses)
(elec. **conductive** coating and solder structures and elec.
conductive products prepared from the structures)

IT **Metals**, uses

RL: MOA (Modifier or additive use); USES (Uses)
(**precious metal-coated**; elec. **conductive**
coating and solder structures and elec. **conductive** products
prepared from the structures)

IT Rubber, synthetic

RL: DEV (Device component use); POF (Polymer in formulation); TEM
(Technical or engineered material use); USES (Uses)
(acrylic, elec. **conductive** coating and solder structures and elec.
conductive products prepared from the structures)

IT Rubber, synthetic

RL: DEV (Device component use); POF (Polymer in formulation); TEM
(Technical or engineered material use); USES (Uses)
(acrylic acid-acrylonitrile-butadiene, carboxy-terminated, Hycar 1072;
elec. **conductive** coating and solder structures and elec. **conductive**
products prepared from the structures)

IT Electric conductors

(coatings, elec. **conductive** coating and solder structures and elec.
conductive products prepared from the structures)

IT Coating materials

(elec. **conductive**, elec. **conductive** coating and solder structures and
elec. **conductive** products prepared from the structures)

IT Vinyl acetal **polymers**

RL: DEV (Device component use); POF (Polymer in formulation); TEM
(Technical or engineered material use); USES (Uses)
(formals, elec. **conductive** coating and solder structures and
elec. **conductive** products prepared from the structures)

IT Siloxanes and Silicones, uses

RL: DEV (Device component use); POF (Polymer in formulation); TEM
(Technical or engineered material use); USES (Uses)
(polyimide-, KJR 651; elec. **conductive** coating and solder structures
and elec. **conductive** products prepared from the structures)

IT Phenolic resins, uses

RL: DEV (Device component use); POF (Polymer in formulation); TEM
(Technical or engineered material use); USES (Uses)
(resol, elec. **conductive** coating and solder structures and elec.
conductive products prepared from the structures)

IT Polyimides, uses

RL: DEV (Device component use); POF (Polymer in formulation); TEM
(Technical or engineered material use); USES (Uses)
(siloxane-, KJR 651; elec. **conductive** coating and solder structures and
elec. **conductive** products prepared from the structures)

IT 24936-74-1, Daiamid D 1700 25014-41-9, Poly(acrylonitrile) 25067-61-2,
Poly(methacrylonitrile) 58421-55-9, Epikote 807 69234-58-8, Crisvon
8566 156107-83-4, PL4348

RL: DEV (Device component use); POF (Polymer in formulation); TEM
(Technical or engineered material use); USES (Uses)
(elec. **conductive** coating and solder structures and elec. **conductive**
products prepared from the structures)

IT 9011-05-6, Formaldehyde-urea **copolymer**

RL: DEV (Device component use); TEM (Technical or engineered material
use); USES (Uses)
(elec. **conductive** coating and solder structures and elec.

conductive products prepared from the structures)

IT 11101-28-3
 RL: MOA (Modifier or additive use); USES (Uses)
 (elec. conductive coating and solder structures and elec. conductive products prepared from the structures)

IT 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-57-5, Gold, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (metal coated with; elec. conductive coating and solder structures and elec. conductive products prepared from the structures)

IT 7440-02-0, Nickel, uses 7440-50-8, Copper, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (**precious metal-coated**; elec. conductive **coating** and solder structures and elec. conductive products prepared from the structures)

IT 9003-18-3 9010-98-4
 RL: DEV (Device component use); POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
 (rubber, elec. conductive coating and solder structures and elec. conductive products prepared from the structures)

L51 ANSWER 35 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1995:693235 HCAPLUS
 DN 123:59149
 ED Entered STN: 22 Jul 1995
 TI Uniform polymer powder composites and their manufacture
 IN Ishida, Tsuneo; Hirai, Yasumasa; Tanaka, Sachiko
 PA Kansai Shingijutsu Kenkyusho K, Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C08J003-12
 ICI C08L101-00
 CC 42-13 (**Coatings**, Inks, and Related Products)
 Section cross-reference(s): 38, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07053726	A2	19950228	JP 1992-327132	19921208
PRAI	JP 1992-327132		19921208		

AB Title composites, useful for plating compns., electromagnetic shields, or sheet electrodes, are prepared by mixing powdered polymers with powdered metals,
 C particles, and/or ceramics and pressurizing into ultrafine powder composites. Ball milling 1:1 200- μ m Flo-blen (polypropylene) and 50- μ m Ni particles under Ar at room temperature for 72 h gave 1- μ m composite particles, which could form lubricating fine plating films. A ball milled mixture of polyethylene 20, polypropylene 80, and **carbon** black 15 parts was hot pressed into a sheet, which was coated with Ag paste to form an electrode with elec. **conductivity** 7.6 + 10-2 S/cm; vs. 5.0 + 10-3 S/cm, for a similar electrode prepared by hot rolling instead of hot pressing.

ST uniformity polymer metal composite; **carbon** black polyolein press forming; ceramic polymer composite uniformity

IT Electrodes
 (base sheets; manufacture of uniformly mixed polymer and **carbon** black composites)

IT **Carbon** black, uses

- RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of uniformly mixed polymer and **carbon black composites**)
- IT Transition **metals**, uses
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of uniformly mixed **polymer/metal composites**)
- IT Coating materials
(platings; manufacture of uniformly mixed **polymer and metal composites**)
- IT Shields
(electromagnetic, manufacture of uniformly mixed elec. **conductive polymer and ceramic composites**)
- IT Polysulfones, uses
RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polyether-, manufacture of uniformly mixed **polymer and metal (or ceramic) composites**)
- IT Polyethers, uses
RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(polysulfone-, manufacture of uniformly mixed **polymer and metal (or ceramic) composites**)
- IT 1309-48-4, Magnesia, uses 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 12033-89-5, Silicon nitride, uses 12047-27-7, Barium titanate, uses 12060-00-3, Lead titanate 25233-30-1, Polyaniline 25233-34-5, Polythiophene 30604-81-0, Polypyrrole
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of uniformly mixed elec. **conductive polymer and ceramic composites**)
- IT 7782-42-5, Graphite, uses 9002-88-4, Polyethylene
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of uniformly mixed polymer and **carbon black composites**)
- IT 31694-16-3, PEEK
RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of uniformly mixed **polymer and metal (or ceramic) composites**)
- IT 9003-07-0, Polypropylene
RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of uniformly mixed **polymer and metal composites** for plating compns.)
- IT 7439-89-6, **Iron**, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-05-3, **Palladium**, uses 7440-06-4, Platinum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-62-2, Vanadium, uses
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM

(Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of uniformly mixed **polymer/metal**
composites)

L51 ANSWER 36 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1995:591356 HCAPLUS

DN 122:320648

ED Entered STN: 07 Jun 1995

TI Coloring materials containing **precious metal** ultrafine
particle-dispersed polymer composites for transparent coloring of glass
surfaces

IN Goto, Kazuo; Murakami, Susumu; Hayashi, Shigehiko; Sayo, Koichi; Noguchi,
Tooru; Yamaguchi, Yoshio

PA Mitsuboshi Belting Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C03C004-02

ICS C03C008-14; C03C017-23

CC 57-1 (Ceramics)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07025641	A2	19950127	JP 1993-164116	19930608
	JP 2554594	B2	19961113		
PRAI	JP 1993-164116		19930608		

AB The title coloring material comprises a polymer composite containing dispersed
precious metal ultrafine particles (without coagulation)
selected from Au, Pt, Pd, Rh and Ag, organometallic compd(s). as fixing
agent(s), binder resin(s), M'-containing organic compd(s)., where M' is
selected

from Si, B and P, as skeletal components of glass, and organic solvent.

ST coloring material transparent coloring glass surface; **precious**
metal dispersed polymer coloring material

IT Coloring materials
(coloring materials containing **precious metal** ultrafine
particle-dispersed **polymer composites** for
transparent coloring of glass surfaces)

IT Glass, oxide

RL: PEP (Physical, engineering or chemical process); PROC (Process)
(coloring materials containing **precious metal** ultrafine
particle-dispersed **polymer composites** for
transparent coloring of glass surfaces)

IT **Polymers**, processes

RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM
(Technical or engineered material use); PROC (Process); USES (Uses)
(coloring materials containing **precious metal** ultrafine
particle-dispersed **polymer composites** for
transparent coloring of glass surfaces)

IT Siloxanes and Silicones, processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or
engineered material use); PROC (Process); USES (Uses)
(glass component of coloring materials; coloring materials containing
precious metal ultrafine particle-dispersed
polymer composites for transparent coloring of glass
surfaces)

IT Coloring

(transparent; coloring materials containing **precious**

- metal** ultrafine particle-dispersed **polymer**
composites for transparent coloring of glass surfaces)
- IT Transition **metals**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(**precious**, coloring materials containing **precious**
metal ultrafine particle-dispersed **polymer**
composites for transparent coloring of glass surfaces)
- IT Coating materials
(transparent, coloring materials containing **precious**
metal ultrafine particle-dispersed **polymer**
composites for transparent coloring of glass surfaces)
- IT 9004-70-0, Nitrocellulose
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; coloring materials containing **precious metal**
ultrafine particle-dispersed **polymer composites** for
transparent coloring of glass surfaces)
- IT 25587-80-8
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(coloring materials containing **precious metal** ultrafine
particle-dispersed **polymer composites** for
transparent coloring of glass surfaces)
- IT 25035-04-5, Nylon 11
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(**composites**; coloring materials containing **precious**
metal ultrafine particle-dispersed **polymer**
composites for transparent coloring of glass surfaces)
- IT 123-54-6D, Acetyl-acetone, salts 518-05-8D, Naphthalic acid, iron salt
3087-37-4 23884-72-2, Iron propoxide
RL: MOA (Modifier or additive use); USES (Uses)
(fixing agent; coloring materials containing **precious**
metal ultrafine particle-dispersed **polymer**
composites for transparent coloring of glass surfaces)
- IT 78-10-4, Silicon ethoxide
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(glass component of coloring material; coloring materials containing
precious metal ultrafine particle-dispersed
polymer composites for transparent coloring of glass
surfaces)
- IT 7440-21-3, Silicon, processes 7440-42-8, Boron, processes 7723-14-0,
Phosphorus, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or
engineered material use); PROC (Process); USES (Uses)
(organic compds. containing, glass component of coloring materials; coloring
materials containing **precious metal** ultrafine
particle-dispersed **polymer composites** for
transparent coloring of glass)
- IT 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6,
Rhodium, uses 7440-22-4, Silver, uses 7440-57-5, Gold, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(ultrafine particles; coloring materials containing **precious**
metal ultrafine particle-dispersed **polymer**
composites for transparent coloring of glass surfaces)

L51 ANSWER 37 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1996:52782 HCAPLUS

DN 124:94687

ED Entered STN: 26 Jan 1996

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

TI Manufacture of porous metal-coated composites by metalization and plasma treatment
 IN Thomas, Thomas Ronald; Badyal, Jas Pal Singh
 PA British Technology Group Ltd., UK
 SO Brit. UK Pat. Appl., 9 pp.
 CODEN: BAXXDU
 DT Patent
 LA English
 IC ICM C23C014-58
 ICS B01J037-02; B01J037-34; C22C001-08; H01M004-04
 ICA H01M008-00
 CC 56-4 (Nonferrous Metals and Alloys)
 Section cross-reference(s): 38, 52, 57

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2287720	A1	19950927	GB 1995-5644	19950321
	GB 2287720	B2	19971105		
	WO 9525588	A1	19950928	WO 1995-GB620	19950321
	W: AU, CA, FI, JP, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	CA 2183763	AA	19950928	CA 1995-2183763	19950321
	AU 9519020	A1	19951009	AU 1995-19020	19950321
	AU 685247	B2	19980115		
	EP 751824	A1	19970108	EP 1995-911450	19950321
	EP 751824	B1	19980520		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
	JP 09510506	T2	19971021	JP 1995-524482	19950321
	AT 166250	E	19980615	AT 1995-911450	19950321
	ES 2116735	T3	19980716	ES 1995-911450	19950321
	US 5798148	A	19980825	US 1996-700367	19960826
	FI 9603749	A	19960920	FI 1996-3749	19960920
PRAI	GB 1994-5518		19940321		
	WO 1995-GB620		19950321		
AB	Porous substrates are metalized with Group VIII metal, followed by plasma treatments for oxidizing the metal and then reducing the oxide for surface roughening. The process is suitable for coating of ceramic, polymeric, or fluoropolymer substrates with Pt, Pd, Ag, and/or Ni film having high surface coverage, especially with the process temperature ≤ 325 K. The resulting porous composites are suitable for use as a catalyst in a fuel cell, sensor, or electrode, or for a chromatog. separator. Microporous PTFE can be coated with Pt film .apprx.1 μ m thick.				
ST	metalized porous composite plasma treatment; precious metal coated composite plasma bake; ceramic porous composite metalization plasma; polymer porous composite metalization plasma; fluoropolymer composite metalization plasma				
IT	Ceramic materials and wares (composites from porous; porous metal-coated composites manufactured by metalization and plasma treatment)				
IT	Fluoropolymers Polymers , processes RL: PEP (Physical, engineering or chemical process); PROC (Process) (composites from porous; porous metal -coated composites manufactured by metalization and plasma treatment)				
IT	Group VIII elements RL: PEP (Physical, engineering or chemical process); PROC (Process) (metalization with; porous composites manufactured by metalization and plasma treatment)				

IT Plasma
(redox, metalization with; porous metal-coated composites manufactured by metalization and plasma treatment)

IT 9002-84-0, PTFE
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(metalization of; porous metal-coated composites manufactured by metalization and plasma treatment)

IT 7440-02-0, Nickel, processes 7440-05-3, Palladium, processes
7440-06-4, Platinum, processes 7440-22-4, Silver, processes 7440-50-8, Copper, processes 11114-80-0
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(metalization with; porous metal-coated composites manufactured by metalization and plasma treatment)

IT 1333-74-0, Hydrogen, processes 7782-44-7, Oxygen, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(plasma; porous metal-coated composites manufactured by metalization and plasma treatment)

L51 ANSWER 38 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1994:36322 HCAPLUS

DN 120:36322

ED Entered STN: 22 Jan 1994

TI Polymer-bonded composites with **precious-metal** powders

IN Hoshino, Koji; Kono, Tooru; Morikawa, Masaki; Mori, Akira

PA Mitsubishi Materials Corp, Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM B22F003-02

ICS B22F001-00

CC 56-4 (Nonferrous Metals and Alloys)

Section cross-reference(s): 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 05263103	A2	19931012	JP 1992-64136	19920319
PRAI	JP 1992-64136		19920319		

AB The composites comprise 82-96% powdered **precious metals** and/or alloys, and the remainder as polymer binders containing 2-10% each of thermoplastic resins and plasticizers. The composites are suitable for decorative articles.

ST **precious metal** powder composite polymer; thermoplastic

resin composite metal powder; plasticizer binder composite metal powder

IT Plasticizers

Acrylic **polymers**, uses

RL: USES (Uses)

(binders containing, **composites** with **precious metal** powders and, for decorative articles)

IT Transition **metals**, uses

RL: USES (Uses)

(noble, powder, decorative **composites** from, with

polymer binders containing thermoplastic resins and plasticizers)

IT 84-74-2, Dibutyl phthalate 1338-43-8, Span 80 25322-68-3, Polyethylene glycol

RL: USES (Uses)

(binders containing, **composites** with **precious metal** powders and, for decorative articles)

IT 7440-22-4, Silver, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses

RL: USES (Uses)

(powder, decorative composites from, with polymer binders containing thermoplastic resins and plasticizers)

L51 ANSWER 39 OF 50 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN

AN 1992-185230 [23] WPIX

DNC C1992-084790

TI **Metal-electroconductive polymer composite**

fine particles - form stable dispersions and comprise e.g. **silver** particles **coated** with e.g. poly pyrrole containing polymeric electrolyte dopant obtd. by redox reaction.

DC A60 A85 A96 B07 G01 G02 H06 P53

IN HOSOKAWA, H; KAMADA, K

PA (MITR) MITSUBISHI RAYON CO LTD

CYC 5

PI EP 488321 A1 19920603 (199223)* EN 9p C08K009-10

R: DE FR GB

JP 04202707 A 19920723 (199236) 5p B22F009-20

US 5215820 A 19930601 (199323) 6p B32B005-16

EP 488321 B1 19971029 (199748) EN 10p C08K009-10

R: DE FR GB

DE 69128065 E 19971204 (199803) C08K009-10

JP 3056522 B2 20000626 (200035) 4p B22F009-20

ADT EP 488321 A1 EP 1991-120442 19911128; JP 04202707 A JP 1990-339674

19901130; US 5215820 A US 1991-799228 19911127; EP 488321 B1 EP

1991-120442 19911128; DE 69128065 E DE 1991-628065 19911128, EP

1991-120442 19911128; JP 3056522 B2 JP 1990-339674 19901130

FDT DE 69128065 E Based on EP 488321; JP 3056522 B2 Previous Publ. JP 04202707

PRAI JP 1990-339674 19901130

REP 3.Jnl.Ref; JP 02120373; JP 02194071; JP 02252760; DE 3321906; EP 269090; JP 2120373; JP 2194071; JP 2252760

IC ICM B22F009-20; B32B005-16; C08K009-10

ICS B22F001-02; B22F009-24; B32B015-02; B32B021-02; C08G061-12;

C08K003-08; C08K009-04

AB EP 488321 A UPAB: 19931006

Particles comprise: (i) metal fine particles (I); and (ii) an electroconductive polymer (II) coated onto the surface of (I). (II) contains a polymeric electrolyte (III) as a dopant.

Preparation of the composite fine particles comprises subjecting, to a redox reaction, (a) a monomer capable of forming (II) by an oxidation reaction and (b) a metallic cpd. capable of forming a redox pair with the monomer. The reaction is carried out in the presence of (III) and also under the bubbling of an inert gas.

USE/ADVANTAGE - The mfg. process is economic and safe. The fine metal particles are of a nanometer level size and are protected from surface oxidation by the polymer coating. The composite particles form stable dispersions in organic materials. Uses include magnetic materials, jet fuels, alloy additives, catalysts, intracellular dyes, carriers for medicines and electroconductive fillers for rubbers, plastics and fibres.

0/0

FS CPI GMPI

FA AB; DCN

MC CPI: A09-A03; A12-B04B; A12-S09; B04-C03; B05-A02; G01-A12; H06-B03

L51 ANSWER 40 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1992:459775 HCAPLUS

DN 117:59775

ED Entered STN: 08 Aug 1992

TI Electrically **conductive** metal sulfide-polymer composites

- prepared by using organosols of metal sulfides
- AU Yamamoto, Takakazu; Kubota, Etsuo; Taniguchi, Atsushi; Dev, Somanath; Tanaka, Kuniaki; Osakada, Kohtaro; Sumita, Masao
- CS Res. Lab. Resour. Util., Tokyo Inst. Technol., Yokohama, 227, Japan
- SO Chemistry of Materials (1992), 4(3), 570-6
CODEN: CMATEX; ISSN: 0897-4756
- DT Journal
- LA English
- CC 76-1 (Electric Phenomena)
- AB Elec. **conducting** metal sulfide (MS; M = Cu, Cd, Zn, etc.)-polymer (poly(acrylonitrile), poly(vinyl butyral), poly(vinylidene fluoride), poly[arylene(1,3-imidazolidine-2,4,5-trione-1,3-diyl)], etc.) composite films are obtained by using organosols containing MS and the polymer. The CuS-polymer composite films exhibit elec. **conductivities** of 1-30 S cm⁻¹ at 40 weight% CuS. The CuS-poly[arylene(1,3-imidazolidine-2,4,5-trione-1,3-diyl)] composite film containing 20-40 weight% CuS is thermally stable up to 250°, has good mech. strength (breaking stress of ca. 108 Pa), and serves as shielding materials for electromagnetic waves intercepting 99% of the electromagnetic wave at 200 MHz. CdS-polymer composites exhibit elec. **conductivities** of 10⁻⁸-10⁻⁴ S cm⁻¹, and ZnS-, α -HgS-, NiS-, PdS-, MnS-, and mixed metal sulfide Zn(Cd)S-polymer composites have elec. **conductivities** in the range 10⁻⁹-10⁻⁴ S cm⁻¹. CuS-polymer and CdS-polymer composites indicate p-type and n-type elec. **conductive** properties, resp. The temperature dependence of the elec. **conductivity** of the MS-polymer composites obeys Arrhenius type equations, giving activation energies of -5.7 kJ/mol for the CuS-poly(vinyl alc.) composite (weight% of CuS = 31), 2.8 kJ/mol for the CuS-80:20 copolymer of vinylidene chloride and acrylonitrile composite (weight% of CuS = 19), and 32 kJ/mol for the CdS-poly(vinylidene fluoride) composite (weight% of CdS = 43). The elec. current is believed to flow through a network of MS formed in the composites. Preparation of MS-polymer composite films on the surface of substrates (e.g., copper sulfide and n-Si) affords heterojunctions, which show rectification of elec. current with rate values of 30-102.
- ST **cond** metal sulfide polymer composite; sulfide composite polymer organosol prepn; copper sulfide polyaryleneimidazolidinetrionediyl composite **cond**
- IT Electric **conductivity** and **conduction**
(of transition **metal** sulfide/**polymer**
composites prepared from **metal** sulfide organosols)
- IT Shields
(electromagnetic, by copper sulfide/polymer composites prepared from organosols)
- IT 24937-79-9, Poly(vinylidene fluoride) 26781-55-5
RL: PRP (Properties)
(elec. **conductivity** of composite films of cadmium sulfide and)
- IT 9002-89-5, Poly(vinyl alcohol) 9010-76-8 25068-14-8
RL: PRP (Properties)
(elec. **conductivity** of composite films of copper sulfide and)
- IT 25014-41-9, Poly(acrylonitrile)
RL: PRP (Properties)
(elec. **conductivity** of composite films of metal sulfides and)
- IT 1314-98-3, Zinc sulfide, properties 1344-48-5, **Mercury** sulfide (HgS) 12125-22-3, **Palladium** sulfide (PdS) 16812-54-7, Nickel sulfide (NiS) 18820-29-6, Manganese sulfide (MnS) 39466-56-3, Cadmium zinc sulfide (CdZnS₂)
RL: PRP (Properties)
(elec. **conductivity** of composite films of poly(acrylonitrile) and)
- IT 1306-23-6, Cadmium sulfide, properties 1317-40-4, Cupric sulfide

RL: PRP (Properties)

(elec. **conductivity** of composite films of polymers and)
IT 28550-63-2D, hydrolyzed 60092-26-4 122341-07-5D, hydrolyzed

RL: PRP (Properties)

(electromagnetic wave shielding material from composite films of copper sulfide and)

L51 ANSWER 41 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1992:561063 HCAPLUS

DN 117:161063

ED Entered STN: 17 Oct 1992

TI Electrochemical color display device

IN Nakanaga, Takefumi; Inubushi, Akiyoshi; Tada, Yuji

PA Otsuka Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G02F001-15

CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03231229	A2	19911015	JP 1990-26845	19900206
PRAI	JP 1990-26845		19900206		
AB	The title electrochem. color display employs an electrochem. color display element comprising an electrochromic transition metal oxide layer and an ionic conductive layer in contact with it, the above ionic conductive layer being based on a composite between a solvated ion(s) and a phosphazene polymer (s) having the polymer segments selected from [N:P{O(CH ₂ CH ₂ O)hMe}2]1, [N:P{O(CH ₂ CH ₂ O)kCH ₂ CH:CH ₂ }O(CH ₂ CH ₂ O)hMe}}]n, [N:P{O(CH ₂ CH ₂ O)kCH ₂ CH:CH ₂ }2], [N:P{O(CH ₂ CH ₂ O)kCH ₂ CH ₂ CH ₂ SO ₃ M}{O(CH ₂ CH ₂ O)hMe}], [N:P{O(CH ₂ CH ₂ O)hCH ₂ CH ₂ CH ₂ SO ₃ M}2], and [N:P{O(CH ₂ CH ₂ O)hCH ₂ CH ₂ CH ₂ SO ₃ M}{O(CH ₂ CH ₂ O)hCH ₂ CH:CH ₂ }] [M = Li, Na, K, Cu , Ag , H; h, k = indicate average number of CH ₂ CH ₂ O groups; 0 ≤ h ≤ 22.5, 0 ≤ k ≤ 15; 3 ≤ 1 + m + n ≤ 20000].				
ST	electrochem color display phosphazene polymer; electrolyte composite phosphazine polymer display				
IT	Phosphazene polymers				
	RL: USES (Uses)				
	(composite with solvated ions, for electrochem. display device)				
IT	Transition metal oxides				
	RL: USES (Uses)				
	(electrochromic, electrochem. color display from)				
IT	Electrochromic materials				
	(transition metal oxide, electrochem. color display from)				
IT	Recording materials				
	(electrochem., color, phosphazene polymer electrolyte for)				
IT	7791-03-9, Lithium perchlorate 14283-07-9, Lithium fluoroborate 33454-82-9				
	RL: USES (Uses)				
	(electrochem. color display from composite of phosphazene polymer with solvated)				
IT	143646-04-2				
	RL: USES (Uses)				
	(electrochem. color display from composite of, with solvated ions)				
IT	1314-62-1, Vanadium oxide, uses 39318-18-8, Tungsten oxide				

RL: USES (Uses)
(in electrochem. color display)

L51 ANSWER 42 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1990:489586 HCAPLUS
DN 113:89586
ED Entered STN: 01 Sep 1990
TI Process for making **noble** metal-coated metallic
particles, and resulting conductive materials
IN Ostolski, Marian J.
PA USA
SO PCT Int. Appl., 114 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01B001-22
ICS B05D001-18; B05D003-00; B05D003-10; B05D007-14; B05D007-24;
B22F001-02
CC 76-2 (Electric Phenomena)
Section cross-reference(s): 38, 56

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	WO 9002406	A1	19900308	WO 1989-US3703	19890828
	W: JP, KR				
	RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE				
EP	591126	A1	19940413	EP 1989-909962	19890828
	R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE				
CA	1339810	A1	19980414	CA 1989-609531	19890828
US	5882802	A	19990316	US 1997-923739	19970902
US	2001031372	A1	20011018	US 1997-969954	19971125
PRAI	US 1988-237898	A	19880829		
	CA 1989-609531	A	19890828		
	WO 1989-US3703	W	19890828		
	US 1990-480224	B1	19900215		
	US 1993-85457	A3	19930630		
	US 1995-482006	B1	19950607		

AB A multi-coated step immersion coating process for producing a **noble** metal **coating** on a particulate **non-noble** metal substrate (spheres) is provided. The coated particles may be used alone or incorporated into resin matrixes to form elec. conductive products, e.g., adhesives and electromagnetic interference shielding materials. A master plating solution containing the required total amount of free noble metal ions required to coat the substrate is divided into a plurality of plating baths, with subsequent immersion in each bath to build up the coating. Rinsing and drying steps are described. The noble metal being plated out is Ag, Au, Pt, Pd, Ir, Rh, Ru, or Os. The **non-noble** metal substrate is Cu, Ni, Al, Ti, Zr, V, Hf, Cd, Nb, Ta, Mo, W, Ga, In, Tl, or their combinations. The post-plating rinsing steps impart superior characteristics, giving the product excellent elec. conductivity, uniformity of coating, and long-term operational stability.

ST **coating noble** metal conductor; shield electromagnetic coated particle

IT Epoxy resins, uses and miscellaneous
Polyamides, uses and miscellaneous
Polyesters, uses and miscellaneous
Polyureas
Rubber, silicone, uses and miscellaneous

- RL: USES (Uses)
(elec. conductors from **noble** metal-coated metallic particle-containing)
- IT Acrylic **polymers**, uses and miscellaneous
Siloxanes and Silicones, uses and miscellaneous
Urethane **polymers**, uses and miscellaneous
RL: USES (Uses)
(electromagnetic interference shield from, containing **noble** metal-coated metallic particles)
- IT Electric conductors
(**noble** metal-coated metallic particles in matrixes for)
- IT Adhesives
(elec. conductive, **noble** metal-coated metallic particle-containing)
- IT Shields
(electromagnetic, **noble** metal-coated metallic particles in matrixes for)
- IT Siloxanes and Silicones, uses and miscellaneous
RL: USES (Uses)
(fluoro, electromagnetic interference shield from, containing **noble** metal-coated metallic particles)
- IT 9003-07-0, Polypropylene
RL: USES (Uses)
(amorphous, elec. conductive adhesive from, containing **noble** metal-coated metallic particles)
- IT 7439-88-5, Iridium, uses and miscellaneous 7440-04-2, Osmium, uses and miscellaneous
miscellaneous 7440-05-3, **Palladium**, uses and miscellaneous
7440-06-4, **Platinum**, uses and miscellaneous 7440-16-6, Rhodium, uses and miscellaneous
7440-18-8, Ruthenium, uses and miscellaneous 7440-22-4, Silver, uses and miscellaneous
7440-57-5, **Gold**, uses and miscellaneous
RL: USES (Uses)
(coating of, on **non-noble** metallic particles, for conductors and electromagnetic shields)
- IT 92-52-4D, 1,1'-Biphenyl, chloro derivs. 26140-60-3D, Triphenyl, chlorinated
RL: USES (Uses)
(elec. conductive adhesive from, containing **noble** metal-coated metal particles)
- IT 9003-07-0, Eastobond M-5H 9078-63-1, Versalon 1100 11097-69-1, PCB 1254
12642-23-8, Aroclor 5442 24650-42-8, Irgacure 651 24937-78-8, Elvax 150
25085-99-8, GenEpoxy 190 37189-83-6, Versamid 125 39319-95-4, Super-Beckacite 1050
39319-96-5, Superbeckacite 2000 39319-97-6, Superbeckacite 2100
RL: USES (Uses)
(elec. conductors from **noble** metal-coated metallic particle-containing)
- IT 9002-86-2, Polyvinyl chloride 9003-27-4
RL: USES (Uses)
(electromagnetic interference shield from, containing **noble** metal-coated metallic particles)
- IT 7429-90-5, Aluminum, uses and miscellaneous 7439-98-7, Molybdenum, uses and miscellaneous
7440-02-0, Nickel, uses and miscellaneous 7440-03-1, Niobium, uses and miscellaneous
7440-25-7, Tantalum, uses and miscellaneous 7440-28-0, Thallium, uses and miscellaneous
7440-32-6, Titanium, uses and miscellaneous 7440-33-7, Tungsten, uses and miscellaneous
7440-43-9, Cadmium, uses and miscellaneous 7440-50-8, Copper, uses and miscellaneous
7440-55-3, Gallium, uses and

miscellaneous 7440-58-6, Hafnium, uses and miscellaneous 7440-62-2,
Vanadium, uses and miscellaneous 7440-67-7, Zirconium, uses and
miscellaneous 7440-74-6, Indium, uses and miscellaneous

RL: USES (Uses)

(particles, **noble** metal-coated, for conductors and
electromagnetic shields)

L51 ANSWER 43 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1990:100010 HCAPLUS

DN 112:100010

ED Entered STN: 18 Mar 1990

TI Highly filled fluoropolymers

IN Nakamura, Takefusa; Yoshimura, Takahiko

PA Toshiba Silicone Co., Ltd., Japan; Sumitomo Cement Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 18 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08L027-12

ICS C08K003-00

CC 37-6 (Plastics Manufacture and Processing)

Section cross-reference(s): 42

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 01168748	A2	19890704	JP 1987-327648	19871224
PRAI	JP 1987-327648		19871224		

AB Composites having good heat and impact resistance and moldability, useful
for coatings, filters, thermal **conductors**, or sliding materials,
comprise interpenetrating networks of fluoropolymers and low-temperature
melting

inorg. compds. or heat-resistant polymers (except fluoropolymers) having
high-temperature melting inorg. (e.g., metallic or ceramic) powder nuclei.
Ball-milling 4:3:3 vol alumina, PTFE, and glass (low m.p.), press-molding
at 50 kg/cm², and heating 5 times at 380° for 1 min gave an
interpenetrating composite with high mech. strength and low friction
coefficient A coating prepared from the composites showed good adhesion to
fluoropolymer sheets on Al panels.

ST alumina glass PTFE interpenetrating composite; fluoropolymer metal ceramic
interpenetrating composite; filter interpenetrating filler fluoropolymer
composite; coating interpenetrating filler fluoropolymer composite;
thermal **conductor** interpenetrating fluoropolymer composite;
antifriction material interpenetrating fluoropolymer composite

IT Antifriction materials

Filters and Filtration apparatus

Thermal **conductors**

(fluoropolymer interpenetrating composites with heat-resistant polymers
or low-melting inorg. compds. and high-melting inorg. powders for)

IT Glass, oxide

Halides

RL: USES (Uses)

(interpenetrating composites with fluoropolymers and high-melting
inorg. powders, for coatings and moldings)

IT Epoxy resins, uses and miscellaneous

Phenolic resins, uses and miscellaneous

Polythiophenylenes

RL: USES (Uses)

(interpenetrating composites with fluoropolymers and high-melting
inorg. powders, for moldings)

IT Fluoropolymers
RL: USES (Uses)
(interpenetrating composites with heat-resistant polymers or low-melting inorg. compds. and high-melting inorg. powders, for moldings)

IT Oxides, uses and miscellaneous
RL: USES (Uses)
(powdered, interpenetrating composites with fluoropolymers and low-melting inorg. compds. or heat-resistant polymers, for coatings and moldings)

IT **Metals**, uses and miscellaneous
RL: USES (Uses)
(powdered, interpenetrating **composites** with fluoropolymers and low-melting inorg. compds. or heat-resistant **polymers**, for moldings)

IT Carbides
Nitrides
RL: USES (Uses)
(powdered, interpenetrating composites with fluoropolymers and low-temperature melting inorg. compds. or heat-resistant polymers, for coatings and moldings)

IT Rubber, synthetic
RL: USES (Uses)
(fluoro, interpenetrating composites with fluoropolymers and high-melting inorg. powders, for moldings)

IT Coating materials
(heat- and impact-resistant, fluoropolymer interpenetrating composites with heat-resistant polymers or low-melting inorg. compds. and high-melting inorg. powders for)

IT Polyimides, uses and miscellaneous
RL: USES (Uses)
(polyamide-, interpenetrating composites with fluoropolymers and high-melting inorg. powders, for moldings)

IT Polyketones
Polysulfones, uses and miscellaneous
RL: USES (Uses)
(polyether-, interpenetrating composites with fluoropolymers and high-melting inorg. powders, for moldings)

IT Polyamides, uses and miscellaneous
RL: USES (Uses)
(polyimide-, interpenetrating composites with fluoropolymers and high-melting inorg. powders, for moldings)

IT Polyethers, uses and miscellaneous
RL: USES (Uses)
(polyketone-, interpenetrating composites with fluoropolymers and high-melting inorg. powders, for moldings)

IT Polyethers, uses and miscellaneous
RL: USES (Uses)
(polysulfone-, interpenetrating composites with fluoropolymers and high-melting inorg. powders, for moldings)

IT Ceramic materials and wares
(powdered, interpenetrating composites with fluoropolymers and low-temperature melting inorg. compds. or heat-resistant polymers, for coatings and moldings)

IT 7646-85-7, Zinc chloride, uses and miscellaneous 7718-54-9, Nickel chloride, uses and miscellaneous 11099-06-2 111093-02-8, Tiranocoat
RL: USES (Uses)
(interpenetrating composites with fluoropolymers and high-melting

- inorg. powders, for coatings and moldings)
- IT 24937-79-9, Poly(vinylidene fluoride) 24981-14-4, Poly(vinyl fluoride)
25038-71-5, Ethylene-tetrafluoroethylene copolymer 25067-11-2,
Hexafluoropropylene-tetrafluoroethylene copolymer 25101-45-5,
Ethylene-chlorotrifluoroethylene copolymer 59947-24-9,
Poly(chlorofluoroethylene)
RL: USES (Uses)
(interpenetrating composites with heat-resistant polymers or low-temperature
melting inorg. compds. and high-temperature melting inorg. powders, for
coatings or moldings)
- IT 7429-90-5, Aluminum, uses and miscellaneous
RL: USES (Uses)
(panels, inorg. compound-fluoropolymer interpenetrating composite
coatings for, with good adhesion)
- IT 1344-28-1, Alumina, uses and miscellaneous 7439-89-6, Iron,
uses and miscellaneous 7439-92-1, Lead, uses and miscellaneous
7439-95-4, Magnesium, uses and miscellaneous 7439-96-5, Manganese, uses
and miscellaneous 7439-98-7, Molybdenum, uses and miscellaneous
7440-02-0, Nickel, uses and miscellaneous 7440-05-3, Palladium
, uses and miscellaneous 7440-06-4, Platinum, uses and miscellaneous
7440-22-4, Silver, uses and miscellaneous 7440-31-5, Tin, uses and
miscellaneous 7440-50-8, Copper, uses and miscellaneous 7440-57-5,
Gold, uses and miscellaneous 7440-66-6, Zinc, uses and miscellaneous
12597-68-1, Stainless steel, uses and miscellaneous
RL: USES (Uses)
(powdered, interpenetrating composites with fluoropolymers and
low-temperature
melting inorg. compds. or heat-resistant polymers, for coatings and
moldings)
- IT 116-14-3D, polymers with perfluoroalkenes 9002-84-0, PTFE 65099-45-8,
Teflon MP 10
RL: USES (Uses)
(sheets, inorg. compound-fluoropolymer interpenetrating composite
coatings for)

L51 ANSWER 44 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1990:37529 HCAPLUS

DN 112:37529

ED Entered STN: 04 Feb 1990

TI Zerovalent metal-polymer composites. II. Metal-polymer microdispersions

AU Warshawsky, A.; Upson, D. A.

CS Res. Lab., Eastman Kodak Co., Rochester, NY, 14650, USA

SO Journal of Polymer Science, Part A: Polymer Chemistry (1989), 27(9),
2995-3014

CODEN: JPACEC; ISSN: 0887-624X

DT Journal

LA English

CC 38-3 (Plastics Fabrication and Uses)

AB Metalization of water-soluble polymers incorporating metal-binding ligands is
achieved by binding **Pd** ions at substoichiometric levels,
followed by reduction to polymer-zero-valent **Pd** complex and
deposition of transition metal ions by electroless plating solns. The
polymers studied include poly[N,N,N-trimethyl-N-(m- and
p-vinylbenzyl)ammonium chloride], poly(L-glutamic acid, poly(L-lysine),
and a copolymer of 2-phenylhydroquinone and 2-aminophthalic acid. Noble
metal polyelectrolyte solns. were directly reduced with
dimethylamineborane to stable microdispersions. The reactive **Ni**
, **Co**, and **Cu** microdispersions were coated on Kodak Estar film base. SEM,
ESCA, and IR were used for material characterization. **Conductivity** and

magnetic properties were also measured. Hydrophobic materials such as graphite and fluorinated graphite were metalized in organic solvents using hydrophobic trioctylammonium-tetrachloropalladate as the activating noble metal complex. The metalized **conductive** graphites were evaluated for their electrochem. properties.

- ST zerovalent **palladium** polymer composite microdispersion;
metalized zerovalent **palladium** polymer microdispersion;
polytrimethylvinylbenzylammonium chloride zerovalent **palladium**
composite; polyglutamic acid zerovalent **palladium** composite;
polylysine zerovalent **palladium** composite; phenylhydroquinone
copolymer zerovalent **palladium** composite; aminophthalate
copolymer zerovalent **palladium** composite; magnetic property
zerovalent **palladium** polymer; **cond** zerovalent
palladium polymer composite; **conductive** graphite
metalized electrochem property
- IT Polyesters, uses and miscellaneous
RL: SPN (Synthetic preparation); PREP (Preparation)
(metalized zerovalent **palladium**-polymer composite
microdispersions coated on Estar, preparation and characterization of)
- IT Coercive force, magnetic
Electric resistance
Magnetic property and Magnetism
Surface analysis
(of metalized zerovalent **palladium**-polymer composite
microdispersions)
- IT Polymer morphology
(ordered, of metalized zerovalent **palladium**-polymer composite
microdispersions)
- IT 7440-05-3P, **Palladium**, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(**polymer composites, metalized,**
microdispersions, preparation and characterization of)
- IT 7440-06-4P, Platinum, preparation 7440-22-4P, Silver, preparation
7440-57-5P, Gold, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(polymer composites, microdispersions, preparation and characterization of)
- IT 1838-13-7, Dimethylaminoborane 7681-53-0
RL: USES (Uses)
(reducing agents, for preparation of zerovalent **palladium**-polymer
microdispersions)
- IT 9003-05-8P, Polyacrylamide
RL: SPN (Synthetic preparation); PREP (Preparation)
(zerovalent copper-poly(trimethylvinylbenzyl)ammonium chloride
composite microdispersions stabilized with, preparation and characterization
of)
- IT 24991-23-9P 25104-18-1P, Poly(L-lysine) 25513-46-6P, Poly(L-glutamic
acid) 38000-06-5P, Poly(L-lysine) 90137-80-7P 107514-85-2DP,
hydrogenated 107556-10-5DP, hydrogenated
RL: SPN (Synthetic preparation); PREP (Preparation)
(zerovalent **palladium** composites, metalized,
microdispersions, preparation and characterization of)
- IT 7440-02-0P, Nickel, uses and miscellaneous 7440-48-4P, Cobalt, uses and
miscellaneous 7440-50-8P, Copper, uses and miscellaneous
RL: SPN (Synthetic preparation); PREP (Preparation)
(zerovalent **palladium**-polymer composites electroless-
deposited with, microdispersions, preparation and characterization of)

DN 112:78823
ED Entered STN: 03 Mar 1990
TI Zerovalent metal-polymer composites. I. Metallized beads
AU Warshawsky, A.; Upson, D. A.
CS Res. Lab., Eastman Kodak Co., Rochester, NY, 14650, USA
SO Journal of Polymer Science, Part A: Polymer Chemistry (1989), 27(9),
2963-94
CODEN: JPACEC; ISSN: 0887-624X
DT Journal
LA English
CC 38-2 (Plastics Fabrication and Uses)
Section cross-reference(s): 42, 77
AB Binding of a noble metal salt, e.g., PdCl₄²⁻, to a functional ligand on a
polymer surface, e.g., amine, quaternary ammonium, sulfonic acid, followed
by reduction to zerovalent state and subsequent reductive deposition of
transition metal ions, such as Cu, Ni, Co, provides a sequence
of events leading to controlled zerovalent metal polymer composites.
Metalization of submicron and larger beads are described. Large amts. of
metal can be incorporated. The metalized beads retain the shape of the
starting beads, even at high bonding of metal. They adapt the properties
of the metal, e.g., magnetic properties. The submicron particles are
sensitive to hydrolysis. Multicomponent systems, such as multimetallic
beads, are provided by additive codeposition of metal ions, or by
codeposition of metal and dye. Direct deposition of metal to
preimmobilized dye ligands is also possible, leading to magenta, cyan, or
yellow metallic beads, with no adverse influence on the magnetic
properties. Further depositions of noble metals by subtractive deposition
on active metal surfaces is also described. Submicron lattices can be
immobilized by coating on polyester-based films, e.g., Kodak Estar base,
and then activated with Pd and metalized to form highly
conductive film surfaces.
ST zerovalent metal polymer composite bead; metalization polymer composite
bead; **palladium** binding polymer composite bead; copper
deposition zerovalent metal polymer; nickel deposition zerovalent metal
polymer; cobalt deposition zerovalent metal polymer; magnetic property
metalized polymeric bead
IT **Polymers**, uses and miscellaneous
RL: USES (Uses)
(functionalized, zerovalent **palladium composites**,
electroless **metalization** of, characterization and properties
of beads from)
IT Polyesters, uses and miscellaneous
RL: USES (Uses)
(**metalization** of zerovalent **palladium-**
polymer composites supported by Estar, properties of
beads from)
IT Spheres
(**metalized** zerovalent **palladium-polymer**
composites, preparation and characterization)
IT Electric resistance
Magnetic property and Magnetism
Surface analysis
(of metalized zerovalent **palladium-polymer** composite beads)
IT Polymer morphology
(of metalized zerovalent **palladium-polymer** composite beads,
effect of electroless metalization conditions on)
IT Coating process
(electroless, **metalization**, of zerovalent **palladium**
-polymer composites, characterization and

- properties of beads from)
- IT 50-00-0, Formaldehyde, uses and miscellaneous 74-94-2, Dimethylamineborane 102-60-3, Quadrol 527-07-1, Sodium gluconate 7447-39-4, Copper chloride, uses and miscellaneous 7646-79-9, Cobalt chloride, uses and miscellaneous 7718-54-9, Nickel chloride, uses and miscellaneous 7722-88-5 7758-98-7, Copper sulfate, uses and miscellaneous 36026-88-7
- RL: USES (Uses)
- (electroless plating solns. containing, in preparation of metalized zerovalent
- palladium**-polymer composite beads)
- IT 125141-15-3 125141-16-4D, reaction products with functionalized polymers 125141-17-5D, reaction products with functionalized polymers
- RL: USES (Uses)
- (metalization of immobilized, characterization and properties of beads from)
- IT 9002-24-8D, Amberlite IRA 400, **palladium** complexes, reduced 13820-53-6D, complexes with functionalized polymers, reduced 77238-33-6D, Amberlite IRA 120, **palladium** complexes, reduced 125210-52-8D, **palladium** complexes, reduced 125210-53-9D, **palladium** complexes, reduced 125220-54-4D, **palladium** complexes, reduced 125220-55-5D, **palladium** complexes, reduced 125220-56-6D, **palladium** complexes, reduced 125241-27-2D, **palladium** complexes, reduced 125241-28-3D, **palladium** complexes, reduced 125378-74-7D, **palladium** complexes, reduced
- RL: PROC (Process)
- (metalization of, electroless, characterization and properties of beads from)
- IT 25249-59-6D, **palladium** complexes, reduced 125378-73-6D, **palladium** complexes, reduced
- RL: USES (Uses)
- (metalization of, electroless, magnetic properties of ion-exchanged beads from)
- IT 125053-38-5, Duolite ES 1101 125053-39-6, Duolite ES 2101
- RL: USES (Uses)
- (metalized zerovalent **palladium**-polymer composite beads ion-exchanged with, magnetic properties of)

L51 ANSWER 46 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1987:517031 HCAPLUS

DN 107:117031

ED Entered STN: 05 Oct 1987

TI Electrically conductive fillers

IN Morishita, Yasuhiro

PA Kojundo Kagaku Kenkyusho K. K., Japan

SO Jpn. Kokai Tokkyo Koho, 3 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08K009-02

ICS C09C001-62; C09D005-24

ICA C09J001-00

CC 42-5 (Coatings, Inks, and Related Products)

Section cross-reference(s): 37, 56

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 62041238	A2	19870223	JP 1985-180592	19850819
PRAI JP 1985-180592		19850819		

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

- AB Title fillers having good stability and processability in polymer coatings and plastics are manufactured by coating Cu beads ≤ 1 mm in diameter with a Ni or Ni alloy layer 0.1-5 μ thick, then a noble metal layer 0.01-0.5 μ thick. Thus, 500 g Cu microspheres (5-10 μ in diameter) were treated with dilute aqueous HCl, washed with H₂O, treated with Ni 701 (electroless Ni-plating bath) at 80° to form a 0.4- μ coating, and then with K 24N (electroless Au-plating bath) at 85° to form a 0.03- μ Au coating. When 75 parts of the plated microspheres were mixed with 25 parts acrylic polymer, spread on alumina plates, and dried at 80° for 1 h, the resulting coating showed resistivity 6.8 ± 10^{-4} Ω -cm initially and resistivity increase 0.2% after 1000 h at 150°; vs. 2.5 ± 10^{-3} Ω -cm and 18% using the unplated Cu microspheres.
- ST elec **conductive** filler **polymer**; nickel gold coated copper bead; precious metal plated copper microsphere
- IT Acrylic polymers, uses and miscellaneous
RL: TEM (Technical or engineered material use); USES (Uses)
(coatings, elec. conductive, thermally stable fillers for, nickel- and precious metal-plated copper microspheres as)
- IT Electric **conductors**
(coatings, heat-resistant, **polymers** containing nickel- and precious metal-plated copper microspheres)
- IT Heat-resistant materials
(elec. conductive, plastics and **coatings** containing nickel- and **precious metal**-plated copper microsphere fillers)
- IT Coating materials
(elec. **conductive**, heat-resistant, **polymers** containing nickel- and precious metal-plated copper microspheres)
- IT Transition metals, uses and miscellaneous
RL: USES (Uses)
(precious, copper microspheres plated with nickel and, fillers for thermally stable conductive plastics and coatings)
- IT 7440-57-5, Gold, uses and miscellaneous
RL: USES (Uses)
(copper microspheres plated with nickel and, fillers for thermally stable conductive plastics and coatings)
- IT 7440-02-0, Nickel, uses and miscellaneous
RL: USES (Uses)
(copper microspheres plated with precious metals and, fillers for thermally stable conductive plastics and coatings)
- IT 110279-07-7
RL: USES (Uses)
(copper microspheres treated with, fillers for thermally stable conductive plastics and coatings)
- IT 7440-50-8, Copper, uses and miscellaneous
RL: USES (Uses)
(microspheres, plated with nickel and precious metals, fillers for thermally stable conductive plastics and coatings)
- IT 110280-12-1
RL: USES (Uses)
(nickel-plated copper microspheres treated with, fillers for thermally stable conductive plastics and coatings)
- L51 ANSWER 47 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1987:187467 HCAPLUS
DN 106:187467
ED Entered STN: 29 May 1987
TI Electrically **conductive** magnetic microballoons and compositions incorporating them.

IN Gindrup, Wayne L.; Vinson, Rebecca R.
 PA Carolina Solvents, Inc., USA
 SO U.S., 7 pp. Cont.-in-part of U.S. Ser. No. 612,622.
 CODEN: USXXAM
 DT Patent
 LA English
 IC ICM H01F001-00
 ICS H01F001-26; C04B035-04; H01B001-06
 NCL 252062540
 CC 76-2 (Electric Phenomena)
 Section cross-reference(s): 77

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4624798	A	19861125	US 1985-702684	19850219
	US 4624865	A	19861125	US 1984-612622	19840521
	CA 1256628	A1	19890627	CA 1984-463244	19840914
	JP 60254514	A2	19851216	JP 1984-248255	19841126
	JP 03081241	B4	19911227		
PRAI	US 1984-612622		19840521		
AB	Elec. conductive microparticles characterized by high conductivity and low d. are comprised of elec. nonconductive magnetic microballoons having an elec. conductive metal coating. When dispersed in an elec. nonconductive matrix, an elec. conductive composite material is formed in which the microparticles form a network of contacting particles throughout the matrix. The microballoons are ceramic microspheres on centrospheres derived from the ash from coal-fired furnaces. The conductive composites are useful, e.g., as electromagnetic wave shields and for prevention of static charges.				
ST	magnetic microballoon elec conductive ; metal coated ceramic microsphere				
IT	Magnetic substances (ceramic microballoons, elec. conductive composites from methyl-coated, in nonconductive matrix)				
IT	Acrylic polymers , uses and miscellaneous Epoxy resins, uses and miscellaneous RL: PRP (Properties) (elec. conductive composites from metal -coated magnetic ceramic microballoons in matrix of)				
IT	Electric conductors (metal-coated ceramic microballoons, in nonconductive matrix)				
IT	Ceramic materials and wares (microspheres, magnetic, elec. conductive composites from metal-coated, in nonconductive matrix)				
IT	7439-88-5, Iridium, properties 7440-02-0, Nickel, properties 7440-04-2, Osmium, properties 7440-05-3, Palladium , properties 7440-06-4, Platinum, properties 7440-22-4, Silver, properties 7440-31-5, Tin, properties 7440-50-8, Copper, properties 7440-57-5, Gold, properties RL: PRP (Properties) (magnetic ceramic microballoons coated with, in elec. conductive matrix)				
IT	1332-37-2, Iron oxide, properties 7439-89-6, Iron , properties RL: PRP (Properties) (magnetic ceramic microballoons containing, in elec. conductive composite)				

L51 ANSWER 48 OF 50 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN

KATHLEEN FULLER EIC 1700 REMSEN 4B28 571/272-2505

AN 1986-246237 [38] WPIX
DNN N1986-183993 DNC C1986-105914
TI Preparation of composite from metal and electrically conducting polymer - by treating with complexing agent and using as anode in electrolyte containing anodically oxidisable monomer and salt.
DC A26 A32 A85 L03 M13 U11 X12 X16
IN HECKMANN, W; MUNSTEDT, H; NAARMANN, H
PA (BADI) BASF AG
CYC 1
PI DE 3508266 A 19860911 (198638)* 8p
ADT DE 3508266 A DE 1985-3508266 19850308
PRAI DE 1985-3508266 19850308
IC C25D013-08; H01L029-28; H01M004-60; H01R043-00
AB DE 3508266 A UPAB: 20010910
Composites from metals and electrically conducting polymers are prepared by treating the surface of the metal with a metal complexing agent, connecting the treated metal, as anode, in a solution containing an anodically oxidisable monomer and a conducting salt, and polymerising the monomer anodically.
USE - Is as electrodes for sec. cells, e.g.
re-chargeable batteries, as screening material, as semi-conductor units, or as electrical conductors. High energy density can be achieved. Bonding between metal and polymer is strong. Composites can be prepared from **non-noble** metals, e.g.
Al, and conducting polymers.
ADVANTAGE - Pref. a pyrrole or thiophene cpd. is anodically oxidised. The metal layer is of Al or an Al alloy. Opt., the metal surface is treated with a mixture of a complex-former, a pyrrole and/or thiophene monomer, a conducting salt and opt. a solvent, followed by anodic oxidation.
Dwg.0/0
FS CPI EPI
FA AB
MC CPI: A05-J; A09-A03; A10-D; A11-B05C; A12-E; A12-E06A; A12-E07C; L03-A01B; L03-E01B; L04-E; M11-G; M13-H05
EPI: U11-A09; X12-D01C; X16-E01

L51 ANSWER 49 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1983:548495 HCAPLUS
DN 99:148495
ED Entered STN: 12 May 1984
TI **Precious metal-coated** strips as blanks for electrical contacts
IN Gevatter, Hans Juergen; Mueller, Bernhard; Neese, Hans Joachim
PA Duerrwaechter, Dr. Eugen, DODUCO, Fed. Rep. Ger.
SO Ger. Offen., 20 pp.
CODEN: GWXXBX
DT Patent
LA German
IC C25D005-48; B21B003-00; C25D007-06; C22F001-00; C25D005-50
CC 72-8 (Electrochemistry)
Section cross-reference(s): 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 3206262	A1	19830908	DE 1982-3206262	19820220
	DE 3206262	C2	19860213		
	EP 87132	A1	19830831	EP 1983-101533	19830218
	EP 87132	B1	19870527		

R: BE, CH, DE, FR, GB, IT, LI, SE

US 4521257 A 19850604 US 1983-468661 19830222

PRAI DE 1982-3206262 19820220

AB A **non-noble** metal is coated with Ni as an intermediate layer and then electroplated with a noble or precious metal to form blanks for elec. contacts. Thus, a bronze (CuSn6) strip 0.55 mm thick and 3 mm wide was electroplated with 3 μ m Ni and then with 2 μ m Au. The strip was then heated .apprx.5 min at 600° and rolled to 0.4 mm to form material suitable for elec. contacts.

ST gold electroplating elec contact; noble metal electroplating elec contact

IT Electric contacts

(noble metal electroplating of blank for)

IT Transition metals, uses and miscellaneous

RL: USES (Uses)

(noble, electroplating of, on blank for elec. contact)

IT 7440-57-5, uses and miscellaneous 59071-54-4

RL: USES (Uses)

(electroplating of, on blank for elec. contact)

L51 ANSWER 50 OF 50 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1976:450706 HCAPLUS

DN 85:50706

ED Entered STN: 12 May 1984

TI **Coating** compositions containing **precious metals**

IN Anthoefer, Fritz; Apelt, Bernd; Siebert, Albert; Sattler, Dieter

PA Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler, Fed. Rep. Ger.

SO Ger. Offen., 8 pp.

CODEN: GWXXBX

DT Patent

LA German

IC C04B

CC 56-5 (Nonferrous Metals and Alloys)

Section cross-reference(s): 57

FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 2435859	A1	19760205	DE 1974-2435859	19740725
	DE 2435859	B2	19771027		
	BR 7504701	A	19760706	BR 1975-4701	19750723
	FR 2279695	A1	19760220	FR 1975-23175	19750724
	FR 2279695	B1	19800509		
	ES 439708	A1	19770301	ES 1975-439708	19750724
	GB 1524701	A	19780913	GB 1975-30985	19750724
	NL 7508897	A	19760127	NL 1975-8897	19750725

PRAI DE 1974-2435859 19740725

AB A Au alloy containing 3-40% **nonnoble** metal constituents having a m.p. >1400° is used for decorative coatings on ceramics which are then fired at 1100-1400°. A portion of the **nonnoble** metal content is optionally replaced with Pt, Pd and/or Rh. The alloy and 10% flux are generally used in a 30-80% suspension in an organic solvent. Thus, Au-20%Ti [59782-13-7] powder was dispersed in a polyacrylic resin dissolved in a terpene. The coating had a golden color and was applied by machine.

ST gold alloy coating ceramic

IT Ceramic materials and wares

(coating on, gold alloy)

IT Coating materials

(gold alloys, on ceramics)

IT 37218-52-3 50945-60-3 52848-65-4 59782-08-0 59782-09-1
59782-10-4 59782-11-5 59782-12-6 59782-13-7
RL: USES (Uses)
(coatings of, on ceramics)

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